

PROPOSED NRC-DEVELOPED SCENARIOS

WITH FACILITY AND NRC COMMENTS

FOR THE PRAIRIE ISLAND INITIAL EXAMINATION - AUGUST 2002

Facility: Prairie Island Scenario No.: 1

Op-Test No.: 2001301

Examiners: _____

_____Operators: _____

Initial Conditions: BOL, recovery from reactor scram 24 hours ago, currently 15% power, D2 OOS, 12 AFW OOS, Place Steam Dump in Stm. Pressure mode Instrument maintenance is performing troubleshooting on the Steam Dump Tave control mode

Turnover: Recovery from Trip 24 hours ago. Raise power to 100% at maximum rate, MSRs are already in service.

Event No.	Malf. No.	Event Type*	Event Description
1		R (RO) N (BOP)	Raise reactor power 5-10%. RO will adjust reactivity by controlling boron concentration BOP will increase power by increasing turbine load, Lineup 13 Feedwater Heater drains for normal operation, Start one heater drain pump per 1C28.4, Heater Drains, and Shutdown the Condenser Spray System per 1C28.5.
2		I (RO) (BOP)	PT 431 (PZR press) fails high - take manual control of pressure and trip bistables (Simulator file number 97-03)
3		C (RO)	Charging pump trip-start another charging pump (Simulator file number 97-02)
4		I (BOP)	PT-484 failure high - Manual control to shut steam dumps (Simulator file 99-05)
5		C (BOP)	11 Condensate pump motor stator HI temp - start a different condensate pump
6		M (All)	Uncontrolled depressurization of both S/G's - steam leak on A steam header results in manual reactor trip (if not already tripped) and stuck open S/G PORV on B S/G - Gets to ECA- 2.1 (Simulator file 97-03)
7		C (BOP)	SI pump fails to start on SI signal-manually start SI pump

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No.: 2002301 Scenario No.: 1 Event No.: 1 Page 1 of 2

Event Description: Raise Reactor Power 5-10%

Time	Position	Applicant's Actions or Behavior
		RX Power Increase
	SRO	DIRECT Load increase at maximum allowed rate per 1C1.4.
		PERFORM or delegate the performance of Steps 5.1.1 to 5.1.6 of 1C1.4, "Power Operation."
	BOP	DETERMINE the Maximum Rate of Load Increase per Step 5.1.7A of 1C1.4, "Power Operation."
	RO	DETERMINE the Maximum Rate of Power Increase per Step 5.1.7A of 1C1.4, "Power Operation."
	BOP	START the load increase as follows: <ul style="list-style-type: none"> -Select the desired load rate on the Turbine EH Control Panel. -Verify the turbine control VALVE POS LIMIT light is OFF. <u>IF NOT, THEN</u> lower the REFERENCE/SETTER until the light is OFF. -Raise the Valve Position Limiter to 100%. -IF ITC is negative, <u>THEN</u> place turbine EH control in "IMP IN." -Set the desired turbine load on the SETTER display on the Turbine EH Control Panel using the reference control pushbuttons.
	RO	INITIATE an alternate dilution of the RCS per C12.5, "Boron Concentration Control," Step 5.4, as necessary.
	BOP	<u>WHEN</u> T_{ave} shows an increase, <u>THEN</u> depress the turbine control GO pushbutton.
	RO	MAINTAIN T_{ave} and T_{ref} matched by varying the alternate dilution rate or performing alternate dilutions per C12.5 as necessary.

Op-Test No.: 2002301 Scenario No.: 1 Event No.: 1 Page 2 of 2

Event Description: Raise Reactor Power 5-10%.

Time	Position	Applicant's Actions or Behavior
	BOP	<p><u>CUE:</u> MSR's are already in service and 13 Feedwater heater drains are already aligned for normal operation.</p> <p>START one heater drain pump per 1C28.4, "Unit 1 Heater Drains," Step 5.1.</p> <p>SHUTDOWN the Condenser Spray System per 1C28.5, "Unit 1 Condenser Spray System," Step 5.2.</p>

Op-Test No.: <u>2001301</u> Scenario No.: <u>1</u> Event No.: <u>2</u> Page <u>1</u> of <u>1</u>		
Event Description: PT431 (PZR press) Fails High		
Time	Position	Applicant's Actions or Behavior
		<p>Pressurizer Pressure 1P-431 - Fails High</p> <p><u>EVALUATOR NOTE:</u> The following annunciator will alarm when the malfunction is inserted: 47012-0408, "PRZR HI/LO Press Channel Alert"</p> <p><u>CRITICAL TASK:</u> PLACE pressurizer pressure controller in MANUAL and stabilize pressure.</p> <p>SELECT 2-1 (white-red) on channel selector switch.</p> <p>RETURN pressure control to AUTO.</p> <p>SELECT another channel on the pressurizer pressure recorder.</p>
	RO	
	SRO	<p>REFER to T.S.3.5.B & Table T.S.3.5-2A FU 7,9,10 and Table TS3.5-2B FU 1d (6 hr LCO for B/S tripping), and T.S. 3.10.J.b</p> <p>Initiate investigation of reason for loss of Pressurizer Pressure 1P-431</p>
	BOP	<p>TRIP and independently verify bistables IAW 1C51.3, "Instrument Failure Guide," Rev. 17.</p> <p>1TC-407-C Over Temp ΔT Trip</p> <p>1TC-407-D Over Temp ΔT Rod Stop</p> <p>1PC-431-A Hi Press Trip</p> <p>1PC-431-J LO Press Trip</p> <p>1PC-431-I Unblock SI</p> <p>1PC-431-G LO Press SI</p>

Op-Test No.: 2001301 Scenario No.: __1__ Event No.: _3__ Page _1_ of _1

Event Description: 11Charging Pump OverloadTrip

Time	Position	Applicant's Actions or Behavior
	RO	11 Charging Pump Trip EVALUATOR NOTE: The following annunciator will alarm when the malfunction is inserted: 47015-0103, "11 Charging Pump Overload Trip." RECOGNIZE reduced charging header and seal injection flow and START a standby Charging Pump IAW 47015-0103, C12.1 AOP1, "Loss of RCP Seal Injection," and C12.1 AOP2, "Loss of Charging Flow To The Regen HX,": CRITICAL TASK: START 12 or 13 Charging Pump. CRITICAL TASK: INCREASE Charging Pump speed to maintain <2550# discharge pressure and seal injection flow ~8 gpm. PLACE L/D in service IAW C12.1, "Letdown, Charging, and Seal Water Injection." ADJUST In-service Charging Pump speed to maintain 6-10 gpm seal injection flow to each RCP while balancing total Charging and L/D flow. PLACE In-service Charging Pump speed control in AUTO.
	SRO	INITIATE investigation of reason for loss of 11Charging Pump.

Op-Test No.: 2002301 Scenario No.: 1 Event No.: 4Page 1 of 1Event Description: high PT-484 MS Header Pressure failure

Time	Position	Applicant's Actions or Behavior
	RO	PT-484 MS Header Pressure failure high Identify failure of PT-484 MS Header Pressure high. TAKE manual control to Steam Pressure controller 484 and CLOSE steam dumps. Monitor and control reactivity transient.
	SRO	<u>CUE:</u> When asked Troubleshooting with Tave mode circuitry is complete and ok to go to Tave mode. DETERMINE Status of Maintenance on Tave mode circuitry and give direction to change steam dump control to Tave mode.

Op-Test No.: 2002301 Scenario No.: 1 Event No.: 5

Page 6 of 10

Event Description: 11Condensate Pump Motor Stator Temperature Increasing

Time	Position	Applicant's Actions or Behavior
		11Condensate Pump Motor Stator Temperature Increasing
		<u>EVALUATOR NOTE:</u> The following annunciator will alarm when the malfunction is inserted: C47009-0302, "11Condensate Pump Motor Stator HI Temp."
	BOP	RESPOND to Alarm C47009-0302, "11Condensate Pump Motor Stator HI Temp."
		RECOGNIZE that 11Condensate Pump has high motor current.
		MONITOR stator temperature increase.
	SRO	SHIFT Condensate Pumps per 1C28.3, "Unit 1 Condensate System," Rev. 10W, Step 5.6, as temperatures continue to increase and prior to stator temperature reaching 140° C.
		Investigate reason for high stator current and temperature.

Op-Test No.: 2002301 Scenario No.: _1___ Event No.: _6&7___ Page _1_ of _5

Event Description: Steam leak on 1A SG safety header followed by 11FRV failure followed by 12 PORV failing open and an uncontrolled depressurization of both S/G's. SI pump does not auto start on SI signal.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Steam Leak on A SG safety relief valve header</p> <p>EVALUATOR NOTE: The following annunciator will alarm when the malfunction is inserted: C47022-0611, "Fire Detection Panel FP121 Fire Alarm."</p> <p>RESPOND to Fire Alarm C47022-0611, "Fire Detection Panel FP121 Fire Alarm.":</p> <ul style="list-style-type: none"> -Determine affected zone -Page Aux. Bldg. Operator -Bypass affected zone -Reset fire detection panel <p>CUE: If the field operator is contacted to investigate the fire alarm in the Aux. Bldg. report that there is a large feather of steam coming from Loop A safety valve header.</p> <p>EVALUATOR NOTE: The 11 FRV will fail open. The operator will attempt unsuccessful to take MANUAL control of the Feedwater Regulating Valves from the control room.</p> <p>11 FRV Fails Open</p>
	SRO	<p>DIRECT operators to enter C28.2 AOP1, "Unit 1 Feedwater Regulating Valve Control Failure."</p>
	BOP	<p>DISPATCH personnel to locally control at manual loading station.</p> <p>CUE: If the crew requests to take local control of 11 SG FRV then report that you are unable to approach the valve because of the steam leak in the area.</p>

Op-Test No.: 2002301 Scenario No.: _1_ Event No.: _6&7_

Page _2_ of _5

Event Description: Steam leak on 1A SG safety header followed by 11FRV failure followed by 12 PORV failing open and an uncontrolled depressurization of both S/G's. SI pump does not auto start on SI signal.

Time	Position	Applicant's Actions or Behavior
	BOP	REPORT to SRO that atmospheric conditions from steam leak prevent local manual control.
	SRO	DIRECT the reactor to be manually tripped before tripping due to high steam generator level.
		<u>EVALUATOR NOTE:</u> When a reactor trip is initiated, immediately increase the steam rupture on Loop A safety header. When SI occurs, fail open 12 SG PORV.
	RO	Manually TRIP the reactor
	BOP	<p>VERIFY turbine tripped.</p> <p>VERIFY Safeguards buses energized.</p> <p>CHECK if SI is actuated.</p> <p>VERIFY component alignment.</p> <p><u>EVALUATOR NOTE:</u> 11 SI Pump fails to start</p> <p><u>CRITICAL TASK:</u> Manually START 11 SI pump.</p> <p><u>EVALUATOR NOTE:</u> SRO should direct transition to E-2 when it is recognized that there is a faulted S/G and then into ECA 2.1 when it is recognized that both S/Gs are faulted.</p> <p>E-2, "Faulted Steam Generator Isolation,"</p>
	SRO	DIAGNOSE faulted SG and transition to E-2.
	SRO	DIAGNOSE that both SGs are faulted and transition to ECA -2.1.

Op-Test No.: 2002301_ Scenario No.: 1_ Event No.: _6&7_ Page _3_ of _5_

Event Description: Steam leak on 1A SG safety header followed by 11FRV failure followed by 12 PORV failing open and an uncontrolled depressurization of both S/G's.

Time	Position	Applicant's Actions or Behavior
	RO/ BOP	ECA-2.1, "Uncontrolled Depressurization of Both Steam Generators." Check secondary pressure boundary: <ul style="list-style-type: none">- MSIV's, FRV's, FRV B/P's, SGBD and FW CI valves closed.- Close steam supply valve from one SG to TD AFW pump IAW the note at the top of page 3 of the EOP.- Verify 11 SG PORV closed.
	BOP	CUE: If field operator is dispatched to 12 SG PORV for local operation, report that Aux. Bldg. entry is unsafe based on steam conditions and you are unable to locally operate the PORV from the hot shutdown panel. Control feed flow to minimize RCS cooldown: <ul style="list-style-type: none">-CHECK cooldown rate in RCS cold legs less than 100° F per hour.-THROTTLE AFW flow to a minimum of 40 GPM per SG with a narrow range of less than 5%.- ENSURE RCS temperature is stable <u>or</u> decreasing.

Op-Test No.: 2002301 Scenario No.: 1 Event No.: 6&7

Page 4 of 5

Event Description: Steam leak on 1A SG safety header followed by 11FRV failure followed by 12 PORV failing open and an uncontrolled depressurization of both S/G's.

Time	Position	Applicant's Actions or Behavior
		EVALUATOR NOTE: If at least one SI or RHR pump is running and RCS pressure is less than 1250 psig then secure both RCPs
	RO	CHECK if RCPs should be stopped.
		CHECK PRZR PORVs available and closed and at least one block valve open.
	SRO	INITIATE periodic SG samples.
		VERIFY secondary radiation levels are normal.
	BOP	STOP RHR pumps.
		RESET Containment Spray Signal and Stop CS pumps.
		CHECK RWST level greater than 33%
		RESET SI.
		RESET CI.
		ESTABLISH instrument air to containment

Op-Test No.: 2002301 Scenario No.: 1 Event No.: 6&7

Page 5 of 5

Event Description: Steam leak on 1A SG safety header followed by 11FRV failure followed by 12 PORV failing open and an uncontrolled depressurization of both S/G's.

Time	Position	Applicant's Actions or Behavior
	RO	CHECK for SI termination criteria: <ul style="list-style-type: none">-RCS subcooling greater than 20° F.-RCS pressure greater than 2000 and stable or increasing.-PZR level greater than 7%.
	BOP	VERIFY SI flow is <u>NOT</u> required. STOP SI pumps. <u>TERMINATE SCENARIO:</u> The scenario should be terminated once the crew has verified that SI is no longer required and secured SI.

Facility: Prairie Island Scenario No.: 2

Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: Unit 1 is at 77% power. Load increase per C1.4 is in progress. Unit power was reduced to replace a bearing on 12 MFP. Equip OOS: 11TD AFW Pump, 12 EH oil pump, D5 Diesel Generator, 13 condensate pump to be used in an emergency only.

Turnover: Commence load increase per C1.4

Event No.	Malf. No.	Event Type*	Event Description
1		R (RO) N (BOP)	Load increase per C1.4 File 99-04 RO will adjust reactivity by controlling boron concentration BOP will increase power by increasing turbine load.
2		I (BOP)	Diagnose a hotwell level transmitter failure and perform actions IAW C47009-0601 level goes to -7" BOP must open MV-32041. #x
3		I (RO) N (Ref)	N42 Power range failure high. Crew will respond per 1C51.2 RO must put rods in manual. <i>Remove N42 from service #x</i>
4		C (BOP)	11 Component Cooling Water pump trip, 12 CCW pump fails to start automatically. BOP must recognize the failure of the standby pump to auto start and manually start it.
5 ***		C (RO)	Loss of Instrument Air to containment C34 AOP1 RO must control charging and letdown, and manually control pressure to prevent cycling of PORV's.
6		M (ALL)	Loss of MFW, 12 ^{0.5} MFW is manually tripped on loss of lube oil 1 ⁵ MFW pump trips for unknown reason. *
7		C (RO) (BOP)	AFW starts and then trips - loss of heat sink - RO must stop RCPs - BOP must cross connect Unit 2 AFW

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

* Turbine lube to auto trip

** AT 468 lube high substituted hotwell level transmitter

~~Failure due to severe damage affect hot well level transmitter~~
~~failure removed did not give desired affect.~~

*** add the get normal for BOP

**** Loss of instrument air was removed. Unnecessary and
 made scenario too complex.

Op-Test No.: _____ Scenario No.: 4 Event No.: 3

Page 3 of _____

Event Description: 11 SG pressure channel 1PT-468 failure high
(11 SG PORV opens, must manually close PORV)

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	RECOGNIZE the failed transmitter by the following indications: <ul style="list-style-type: none">- 11 SG pressure channel 1PT-468 failure high- Steam Flow indicator 1FI-464 failure high- 11 SG PORV opens
		PLACE 11 SG PORV controller in "MANUAL" and CLOSE valve
	SRO	DIRECT actions per 1C51.1, "Instrument Failure Guide" for Turbine 1 st stage pressure channel 1PT-485 failure high
	BOP	PERFORM actions per 1C51.1, "Instrument Failure Guide" for Tavg Loop 1B 1T-401 Channel Failure High: <ul style="list-style-type: none">- VERIFY or place 11 SG PORV controller in "MANUAL" and CLOSE valve- VERIFY 11 SG level control operating properly in automatic
	SRO	REFER to the following Tech Spec requirements: <ul style="list-style-type: none">- TS 3.5.B and Table 3.5-2B Functional Unit 1c <p><u>EVALUATOR NOTE:</u> The next step will probably NOT be performed due to 6 hours allowed before the bistables are required to be tripped</p> DIRECT trip of the following bistables: <ul style="list-style-type: none">- 1PC-468-A, "LO/LO PRESS SI"- 1PC-468-B, "LO PRESS ALARM"

Op-Test No.: _____ Scenario No.: 4 Event No.: 3Page 4 of _____

Event Description: 11 SG pressure channel 1PT-468 failure high
(11 SG PORV opens, must manually close PORV)

Time	Position	Applicant's Actions or Behavior
	SRO	<p><u>IF</u> the Thermal Power Monitor is selected to Calorimetric input, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none">- CHECK TPM power unaffected by the steam pressure channel failure- <u>IF</u> affected, <u>THEN</u> CHANGE TPM constant K202 from "0" (Calorimetric input) to "1" (NIS input) per C41.4, "ERCS NSSS Applications Program" <u>AND</u> NOTIFY ERCS computer group <p>INITIATE Work Order to repair instrument</p> <p>MAKE necessary log entries</p>

Op-Test No.: _____ Scenario No.: 4 Event No.: 3

Page 3 of 2

Event Description: 11 SG pressure channel 1PT-468 failure high
(11 SG PORV opens, must manually close PORV)

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p>RECOGNIZE the failed transmitter by the following indications:</p> <ul style="list-style-type: none"> - 11 SG pressure channel 1PT-468 failure high - Steam Flow indicator 1FI-464 failure high - 11 SG PORV opens <p>PLACE 11 SG PORV controller in "MANUAL" and CLOSE valve</p>
	SRO	<p>DIRECT actions per 1C51.1, "Instrument Failure Guide" for Turbine 1st stage pressure channel 1PT-468 failure high</p>
	BOP	<p>PERFORM actions per 1C51.1, "Instrument Failure Guide" for Turbine 1st stage pressure channel 1PT-468 failure high:</p> <ul style="list-style-type: none"> - VERIFY or place 11 SG PORV controller in "MANUAL" and CLOSE valve - VERIFY 11 SG level control operating properly in automatic
	SRO	<p>REFER to the following Tech Spec requirements:</p> <ul style="list-style-type: none"> - TS 3.5.B and Table 3.5-2B Functional Unit 1c <p>EVALUATOR NOTE: The next step will probably NOT be performed due to 6 hours allowed before the bistables are required to be tripped</p> <p><i>not</i> DIRECT trip of the following bistables:</p> <ul style="list-style-type: none"> - 1PC-468-A, "LO/LO PRESS SI" - 1PC-468-B, "LO PRESS ALARM"

Op-Test No.: _____ Scenario No.: 4 Event No.: 3Page 4 of _____

Event Description: 11 SG pressure channel 1PT-468 failure high
(11 SG PORV opens, must manually close PORV)

Time	Position	Applicant's Actions or Behavior
	SRO	<p><u>IF</u> the Thermal Power Monitor is selected to Calorimetric input, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none">- CHECK TPM power unaffected by the steam pressure channel failure- <u>IF</u> affected, <u>THEN</u> CHANGE TPM constant K202 from "0" (Calorimetric input) to "1" (NIS input) per C41.4, "ERCS NSSS Applications Program" <u>AND</u> NOTIFY ERCS computer group <p>INITIATE Work Order to repair instrument</p> <p>MAKE necessary log entries</p>

Op-Test No.: 2002301 Scenario No.: 2 Event No.: 1 Page 1 of 1

Event Description: Load increase per C1.4 RO will adjust reactivity by controlling boron concentration BOP will increase power by increasing turbine load.

Time	Position	Applicant's Actions or Behavior
	SRO	DIRECT Load increase to 100% at maximum allowed rate per C1.4.
	BOP	Inform System Control Center of load increase. May inform Duty Chemist of load increase.
	RO	DILUTE using Alternate Dilute mode. When Tave shows a increase, Then increases turbine load by setting the SETTER and depressing GO.
	BOP	OBSERVE turbine and generator limits Start the load increase as follows: SELECT the desired load rate on the Turbine EH Control Panel. VERIFY the turbine control VALVE POS LIMIT light is OFF. <u>IF</u> NOT, <u>THEN</u> lower the REFERENCE/SETTER until the light is OFF. RAISE the Valve Position Limiter to 100%. <u>IF</u> ITC is negative, <u>THEN</u> place turbine EH control in "IMP IN." SET the desired turbine load on the SETTER display on the Turbine EH Control Panel using the reference control pushbuttons.

Op-Test No.: 2002301 Scenario No.: <u> 2 </u> Event No.: <u> 2 </u> Page <u> 1 </u> of <u> 1 </u>		
Event Description: <u>Diagnose a hotwell level transmitter failure and perform actions IAW C47009-0601 level goes to -7" BOP must open MV-32041.</u>		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>EVALUATOR NOTE: The following annunciators will alarm when the malfunction is inserted: 47009-0601, "1A Condenser Hotwell LO LVL"</p> <p>RECOGNIZE 1A Condenser Hotwell level low alarm as the result of a failed controller. Refers to 47009-601:</p> <p>VERIFY level low</p> <p>VERIFY normal makeup valve CV-31121 is open.</p> <p>CHECK for Leaks.</p> <p>VERIFY level in condensate storage tank is above T.S. minimum</p> <p>VERIFY CDSR dump to CLG Wtr Disch, CV-31123 is closed.</p> <p><u>IF</u> level decreases to -7", <u>THEN</u> OPEN emergency makeup valve MV-32041.</p> <p>EVALUATOR NOTE: This event is designed so that level will go to -7". Opening MV-32041 with the condenser at vacuum results in a rapid flow rate of water from the CST. The AFW pumps may be inoperable because of the CST supply diverted to the condenser. The CST level will be inaccurate and may go to zero.</p>
	SRO	<p>VERIFY the BOP uses the alarm procedure.</p> <p>REVIEW the operability of the AFW system based on CST level IAW TS 3.4.B.</p>

Op-Test No.: 2002301 Scenario No.: 2 Event No.: 3Page 1 of 4Event Description: N42 Power range failure high. Crew will respond per 1C51.2 RO must put rods in manual

Time	Position	Applicant's Actions or Behavior
	RO	<p>EVALUATOR NOTE: The following annunciators will alarm when the malfunction is inserted:</p> <p>47013-0101 NIS Power Range Positive Flux Rate Channel Alert</p> <p>47013-0102 NIS Power Range HI Setpoint Channel Alert <i>Rev 32</i></p> <p>47013-0103 NIS Power Range Overpower Rod Withdrawal Stop</p> <p>47013-0203 NIS Power Range Channel Deviation</p> <p>47013-0303 Computer Alarm Delta I Check Typer</p> <p>47013-0403 Computer Alarm Flux Tilt Check Typer <i>white</i></p> <p>1C51.2 Instrument Failure Guide</p> <p>RECOGNIZES the failed Power Range Instrument by the following indications : OBSERVES control rods stepping in.</p> <p>PLACE control rods in manual control and restore Tave equal to Tref.</p> <p><i># Rods must be in auto</i></p>

Op-Test No.: 2002301 Scenario No.: 2 Event No.: 3Page 2 of 4Event Description: N42 Power range failure high. Crew will respond per 1C51.2 RO must put rods in manual

Time	Position	Applicant's Actions or Behavior
	SRO	DIRECT that N-42 be removed from service.
	BOP	<p>REMOVES N-42 from service as follows:</p> <p>On the MISCELLANEOUS CONTROL <u>AND</u> INDICATION PANEL drawer:</p> <p>PLACE ROD STOP BYPASS switch in the N-42 position.</p> <p>PLACE POWER MISMATCH BYPASS switch in the N-42 position.</p> <p>PLACE UPPER SECTION CURRENT COMPARATOR DEFEAT switch in the N-42 position and VERIFY the Upper Section Channel Defeat Light is LIT.</p> <p>PLACE LOWER SECTION CURRENT COMPARATOR DEFEAT switch in the N-42 position and VERIFY the Lower Section Channel Defeat Light is LIT.</p> <p>On the COMPARATOR AND RATE drawer, PLACE COMPARATOR CHANNEL DEFEAT switch in the N-42 position and VERIFY Comparator Defeat Light is LIT.</p> <p>At N-42 POWER RANGE B drawer, REMOVE, and CONCURRENTLY VERIFY removal of the instrument power fuses.</p> <p>At N-42 POWER RANGE B drawer, REMOVE, and CONCURRENTLY VERIFY removal of the control power fuses.</p>

Op-Test No.: 2002301 Scenario No.: 2 Event No.: 3 Page 3 of 4

Event Description: N42 Power range failure high. Crew will respond per 1C51.2 RO must put rods in manual

Time	Position	Applicant's Actions or Behavior
	BOP/RO	<p>VERIFY the following annunciators are received:</p> <p>47013-0101 NIS POWER RANGE POSITIVE FLUX RATE CHANNEL ALERT</p> <p>47013-0102 NIS POWER RANGE HI SETPOINT CHANNEL ALERT</p> <p>47013-0201 NIS POWER RANGE NEGATIVE FLUX RATE CHANNEL ALERT</p> <p>47014-0203 N42 NUCLEAR OVERPOWER ROD STOP BYPASSED Aqua Light</p> <p>VERIFY the following status lights LIT:</p> <p>44178-0206 PWR RNG LO Q-HI F NC42P</p> <p>44178-0207 PWR RNG HI Q-HI F NC42P</p> <p>44205-0204 PWR RNG HI F RATE NC42U/K</p>
	SRO	<p>REFER to the following Technical Specification requirements:</p> <p>TS 3.5.B & Table 3.5-2A FU 2a. 2b. 3. 4. 7. 8</p> <p>TS 3.10.B.9</p> <p>TS 3.10.C.4</p>

Op-Test No.: 2002301 Scenario No.: 2 Event No.: 3


Page 4 of 4

Event Description: N42 Power range failure high. Crew will respond per 1C51.2 RO must put rods in manual

Time	Position	Applicant's Actions or Behavior
	SRO	<p>DESIGNATE the following bistables to be tripped:</p> <p>1TC-406-A OVER POWER ΔT TRIP</p> <p>1TC-406-B OVER POWER ΔT ROD STOP</p> <p>1TC-406-C OVER TEMP ΔT TRIP</p> <p>1TC-406-D OVER TEMP ΔT ROD STOP</p> <p>EVALUATOR NOTE: The Chief Examiner will decide whether we need to observe the actual tripping of the bistables.</p>

Op-Test No.: 2002301 Scenario No.: 2 Event No.: 4 Page 1 of 1

Event Description: 11 Component Cooling Water pump trip, 12 CC pump fails to start automatically. BOP must recognize the failure of the standby pump to auto start and manually start it.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>EVALUATOR NOTE: The following annunciators will alarm when the malfunction is inserted: C47020-0101 "11 CC Pump Locked Out"</p> <p>1C14 AOP1 Loss of Component Cooling </p> <p>REGONIZE that loss of 11CC pump did not result in an auto start of the 12 CC pump.</p> <p>CRITICAL TASK: START the 12 CC pump and refer to 1C14 AOP1.</p> <p>VERIFY RCP bearing temperatures below 200° F and CC Surge Tank Level is "on scale."</p>
	SRO	<p>Enters TS 3.0.C due to both CC pumps being inoperable. The failure to auto start makes the 12 CC pump inoperable and the requirements of TS 3.3.1 cannot be met.</p> <p>EVALUATOR NOTE: IF the BOP fails to diagnose the failure of the 12 CC pump to start in a timely manner and RCP bearing temperatures get above 200° F or the CC Surge Tank Level goes "off scale" THEN the reactor must be tripped per 1C14 AOP1.</p> <p>C47015 - 0408 Next CV31204</p>

Op-Test No.: 2002301 Scenario No.: 2 Event No.: 5

Page 1 of 2

Event Description: Loss of Instrument Air to containment C34 AOP1 RO must control charging and letdown, and manually control pressure to prevent cycling of PORV's.

Time	Position	Applicant's Actions or Behavior
	RO	<p>EVALUATOR NOTE: Instrument air isolation valve to containment CV 31741 fails closed. Will lose letdown, charging pumps fail to minimum speed, PZR spray valves fail closed, PZR PORV's will be on accumulators. C34 AOP1 Attachment A provides information on how components or systems will respond it will be of minimal help to operators due to the limited loss of Instrument Air.</p> <p>C34 AOP1; Loss of Instrument Air</p> <p>RECOGNIZE loss of air to containment due to CV31741 failing closed (various valves in containment will reposition)</p> <p>REDUCE charging pump speed to limit discharge pressure</p> <p>CONTROL RCS pressure to prevent continued cycling of pressurizer PORV's.</p> <p>TURN OFF some or all pressurizer heaters to prevent PZR PORVs from lifting.</p> <p><i>CUE: Remain on power do not Trip the reactor</i></p>

Op-Test No.: 2002301 Scenario No.: 2 Event No.: 5

Page 2 of 2

Event Description: Loss of Instrument Air to containment C34 AOP1 RO must control charging and letdown, and manually control pressure to prevent cycling of PORV's.

Time	Position	Applicant's Actions or Behavior
	RO	<p>C12.1 AOP2: Loss of Charging to RHX -and/or- C12.1 AOP3; Loss of Letdown to the VCT</p> <p><u>EVALUATOR NOTE:</u> Letdown Isolation Valves; CV-31226, CV-31255, CV-31325, CV-31326, and CV-31327 should all fail closed. The operator will attempt to close them if they are not failed closed.</p> <p>PLACE charging in manual and reduce to minimum speed.</p> <p>CLOSE CV-31198; Charging Line Flow Control Valve and maintain 6-10 gpm to each RCP.</p> <p><u>IF</u> 2 Charging Pumps are running <u>THEN</u> STOP one pump.</p>

Op-Test No.: 2002301 Scenario No.: 2 Event No.: 6 Page 1 of 3Event Description: Loss of MFW, ¹1~~2~~ MFW is manually tripped on loss of lube oil ²1~~2~~ MFW pump trips for unknown reason.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>C47010-0204² 12 Feedwater Pump Aux Oil Pump LO Press</p> <p>VERIFIES Aux Oil Pump running</p> <p>DISPATCH operator locally to Check for leaks.</p> <p>CUE: Field operator reports there is a large amount of oil on the skid and on the floor. After this cue the lo-lo pressure alarm comes in.</p>
	SRO	<p>In preparation for stopping the ²11 Main FWP, DIRECT power decrease to a turbine load of 330 MWe per 1C1.4 AOP1, "Rapid Load Reduction - Unit 1"</p> <p>EVALUATOR NOTE: Because of the loss of instrument air the RO will be forced to emergency borate IAW C12.5 AOP1, "Emergency Boration of The Reactor Coolant System"</p>
	RO	<p>BORATE the RCS as necessary to maintain control rods above the insertion limit and to control delta I within limits:</p> <p>POSITION the Control Switches for the BATP aligned to services as follows:</p> <p>11BATP - CS-46163, 11 BA XFER PMP SPEED CONT CS, to "FAST." CS-46161, 11 BA XFER PMP CS, to "START."</p> <p>12 BATP - CS-46164, 12 BA XFER PMP SPEED CONT CS, to "FAST." CS-46162, 12 BA XFER PMP CS, to "START."</p> <p>POSITION the recirculation control valve HC to 50% on the BAST aligned to services: 1HC-105 or HC-104</p>

11 mfw oil problems - operator reports oil - crew decides to trip - after trip other mfw pump goes away

trip for

Op-Test No.: 2002301 Scenario No.: 2 Event No.: 6 Page 2 of 3

Event Description: Loss of MFW, 11 MFW is manually tripped on loss of lube oil 12 MFW pump trips for unknown reason.

Time	Position	Applicant's Actions or Behavior
	RO	<p>OPEN MV-32086, "Emergency Boration to Charging Pump Suction" using CS-46297</p> <p>VERIFY boric acid flow on 1YIC113, Emergency Boration Integrator</p> <p><u>WHEN</u> the desired amount of boric acid has been added <u>THEN</u> CLOSE MV-32086 using CS-46297</p>
	BOP	<p>REDUCE turbine load in Automatic <u>OR</u> Manual:</p> <ul style="list-style-type: none"> - Automatic: <ul style="list-style-type: none"> • SELECT the desired load rate on the Turbine EHC panel • SET the desired turbine load on the "SETTER" display on the Turbine EHC Panel using the reference control pushbuttons • DEPRESS the turbine control "GO" pushbutton - Manual: <ul style="list-style-type: none"> • DEPRESS the turbine control "TURBINE MANUAL" pushbutton • DEPRESS the "CV" pushbutton until the desired turbine load is reached <p>INJECT TRIP of 12 MFW pump C47010-0102 11 Feedwater Pump Aux Oil Pump LO-LO Press</p> <p><u>CUE: Once operators start to reduce power 12 MFW pump trips for unknown reason and the reactor will trip on LO-LO-SG level or will be manually tripped.</u> Turbine fails to auto trip; manual trip <u>1E-0, "Reactor Trip or Safety Injection"</u></p>
	SRO	DIRECT actions per 1E-0, "Reactor Trip or Safety Injection"
	RO	VERIFY Reactor Trip or Manually Trip the Reactor:

Turbine's press NOT auto trip (losses CV manually)

Op-Test No.: 2002301 Scenario No.: 2 Event No.: 6 Page 3 of 3

Event Description: Loss of MFW, 12 MFW is manually tripped on loss of lube oil 11 MFW pump trips for unknown reason.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>VERIFY Turbine Trip</p> <p>VERIFY Both Safeguards Buses Energized</p> <p>CHECK if SI is Actuated</p>
	SRO	<p>ANNOUNCE Reactor Trip</p> <p>NOTIFY Station Manager and Site Emergency Coordinator</p> <p>ENSURE communication with NRC is established within 1 hour</p> <p>After Verification that SI is not required transition to 1ES-0.1 REACTOR TRIP RECOVERY</p>
	BOP	<p><u>1ES-0.1 Reactor Trip Recovery</u> <i>SI occurs</i> <i>stay in</i></p> <p>Establish conditions to control RCS temperature at 547° F <i>2-0</i></p> <p>Check MSIV's -OPEN</p> <p>Place Steam Dump in "STM PRESS" Mode</p>
	RO	Check RCS Temperature
	BOP	<p>Notify turbine building operator to isolate Unit 1 MSRs per ATT J.</p> <p>Check cooling water pressure Loop A AND Loop B - GREATER THAN 75 PSIG</p> <p><i>Turbine stop valve not closed</i> <i>close control valves</i></p>

- Wait till step 12 to trip APW pump
Because of Red BATT

Op-Test No.: 2002301 Scenario No.: 2 Event No.: 7 Page 1 of 3

Event Description: AFW starts and then trips - loss of heat sink - RO must stop RCPs and depressurize RCS - BOP must depressurize SG's and feed with condensate

Time	Position	Applicant's Actions or Behavior
		<p>EVALUATOR NOTE: After the operators have verified proper AFW flow the running AFW pump will trip due to an electric fault on the pump which will preclude it being restarted. The following annunciators will alarm when the malfunction is inserted: C47010 - 0107, "12 AFWP LOCKED OUT."</p>
	SRO	DIRECT transition to FR-H.1, Loss of Secondary Heat Sink.
	RO	<p>FR-H.1, Loss of Secondary Heat Sink</p> <p>VERIFY secondary heat sink is required. RCS pressure - GREATER THAN ANY INTACT SG PRESSURE RCS hot leg temperature - GREATER THAN 350° F</p>
	BOP	<p>CHECK for secondary heat sink, if none stop RCPs and skip directly to bleed and feed. Wide range level in either SG - GREATER THAN 9% PRZR pressure - LESS THAN 2335 PSIG</p> <p>STOP both RCPs</p> <p>RESTORE AFW flow:</p> <p>DISPATCH operator to determine cause of the AFW pump trip and locally restore AFW.</p>
	SRO	<p>CUE: Field operator reports that the ground fault relay is up at the 12 AFW pump breaker and he cannot restore AFW</p> <p>DIRECT that AFW be cross-tied to Unit 2.</p>

12:18

+graph

2nd

Affi

fug

12:22

Op-Test No.: 2002301 Scenario No.: 2 Event No.: 7 Page 2 of 3Event Description: AFW starts and then trips - loss of heat sink - RO must stop RCPs and depressurize RCS - BOP must depressurize SG's and feed with condensate

Time	Position	Applicant's Actions or Behavior
	BOP	<p>CROSS-CONNECT AFW from Unit 2 IAW 1C28.1, Step 5.7.</p> <p>PLACE CS-46425, 12 MD AFWP control switch in "PULLOUT."</p> <p>PLACE CS-46785, 21 MD AFWP selector switch in "MANUAL."</p> <p>STOP 21 MD AFWP, if running using CS-46770.</p> <p>REQUEST that Unit 2 operators CLOSE 21 MD AFW Pump valves to the Unit 2 S/G</p> <p><u>CUE:</u> Unit 2 reports that MV-32383 and MV-32384 are closed.</p> <p>CLOSE 12 MD AFW Pump discharge valves to the Unit 1 SG's</p> <p>MV-32381 using CS-46316 MV-32382 using CS-46317</p> <p>DIRECT field operator to reposition the following valves:</p> <p>CLOSE AF-13-4 OPEN AF-13-1 and 2AF-13-1</p> <p><u>CUE:</u> Field operator reports AF-13-4 closed and AF-13-1 and 2AF-13-1 open</p> <p>REQUEST the start of 21 MD AFW Pump</p> <p><u>CUE:</u> Unit 2 reports that the 21 MD AFW Pump has been started.</p>

Op-Test No.: 2002301 Scenario No.: 2____ Event No.: __7__ Page _3_ of _3_

Event Description: AFW starts and then trips - loss of heat sink - RO must stop RCPs and depressurize RCS - BOP must depressurize SG's and feed with condensate

Time	Position	Applicant's Actions or Behavior
		<p><u>CRITICAL TASK:</u> THROTTLE flow to Unit 1 SGs as necessary to maintain desired SG level using MV-32381 and MV-32382</p> <p><u>TERMINATE SCENARIO:</u> When AFW has been cross tied to Unit 2</p>

Facility: Prairie Island Scenario No.: 3 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: Unit 1: 100% Power, End of Cycle, Equilibrium Xenon, RCS level = 157 mm, Breaker 16-10 (Bus 16/Bus 26 Bustie) is OOS.

Steam Generator tube leakage of 4 GPD in 11 SG.

Unit 2: 100% power steady state operation

Turnover: The 11 and 13 Heater Drain Pumps are presently running. The 13 HD Pump was just started and the 12 HD Pump was shutdown so that preventive maintenance can be performed on the 12 HD Pump.

Event No.	Malfunction No.	Event Type*	Event Description
1	RX07C	I (RO)	Loop B Tcold transmitter failure high (Rods step in and Charging Pump in "AUTO" increases to maximum speed; must place rod control in "MANUAL")
2	RC22A (5%)	C(RO)	Pressurizer PORV (CV-31232) leaking (requires isolation) <i>and charging pump speed control</i>
3	RX14B (at 80% power)	I (BOP)	12 SG FW Reg Valve controller fails "as is" in AUTO (will need to control 12 SG level in "MANUAL")
4	1T2809A (TRG5) FW13A (at 70% power, TRG6)	R (RO) N (BOP)	High stator temperature on 11 Main Feedwater Pump (requires turbine load decrease to 330 MWe, since will need to shutdown pump) (TRG5) 11 Main Feedwater Pump trip during load reduction (will need to rapidly reduce turbine load). <i>(81°F to 130°F with 300 sec. ramp)</i>
5	FW19A (TRG7)	M(ALL)	Feedwater line break on 11 SG inside containment (300 sec ramp to 100%) (Requires entry into 1E-0 and then 1E-2)
6	TC06 (Time 0)	C(BOP)	Failure of turbine to AUTO trip on Reactor Trip (will require MANUAL turbine trip)
7	RP09A RP09B (Time 0)	C(RO)	Failure of SI to AUTO actuate (will require MANUAL actuation of SI)
8	RP05 (Time 0)	C(BOP)	Failure of Containment Isolation to AUTO actuate on SI (will require MANUAL actuation of Containment Isolation)
9	SG02A	M(ALL)	SGTR on 11 SG <i>on Activation of Safety Injection</i> when SG is fully depressurized (300 gpm instantaneous) (Requires entry into 1E-3 and then 1ECA-3.1)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Added Malfunction Numbers
per licensee input.

Concur. Changes
incorporated.
N. Valen

Op-Test No.: _____ Scenario No.: 3 Event No.: 1Page 1 of _____

Event Description: Loop B Tcold transmitter failure high
 (Rods step in and Charging Pump in "AUTO" increases to maximum speed; must place rod control in "MANUAL")

and charging pump speed control

Time	Position	Applicant's Actions or Behavior
		EVALUATOR NOTE : The following annunciators will alarm when the malfunction is inserted: - 47012-0104, "REACTOR COOLANT SYSTEM HI TAVG" - 47012-0304, "REACTOR COOLANT SYSTEM TAVG DEVIATION" - 47012-0604, "REACTOR COOLANT SYSTEM ΔT DEVIATION" - 47013-0305, "AUCTIONEERED TAVG-TREF DEVIATION"
	SRO/RO	RECOGNIZE the failed transmitter by the following indications: - Tavg Loop B failed high (Blue) - ΔT Loop B failed low (blue) - Rods stepping in
	RO	PLACE rod control in "MANUAL"
	SRO	DIRECT actions per 1C51.1, "Instrument Failure Guide" for Tavg Loop 1B 1T-40 ³ / ₃ Channel Failure High
	RO	PERFORM actions per 1C51.1, "Instrument Failure Guide" for Tavg Loop 1B 1T-40 ³ / ₃ Channel Failure High: - VERIFY or place rod control in "MANUAL" and maintain Tavg equal to Tref - PLACE charging pump speed control in "MANUAL" and maintain pressurizer level - SELECT Red channel on the Tavg defeat switch and pull out - RETURN rod control and charging pump speed to "AUTO"
	RO	Add step to reflect performing actions for ARP 47012-0104, "REACTOR COOLANT SYSTEM HI TAVG".

Concur.
 Changes incorporated.
N. Valdez

Op-Test No.: _____ Scenario No.: 3 Event No.: 1Page 2 of _____

Event Description: Loop B Tcold transmitter failure high
 (Rods step in and Charging Pump in "AUTO" increases to maximum speed; must place rod control in "MANUAL")

and charging pump speed control

Time	Position	Applicant's Actions or Behavior
	SRO	<p>REFER to the following Tech Spec requirements:</p> <ul style="list-style-type: none"> - TS 3.5.B and Table 3.5-2A Functional Units 7 and 8 - TS 3.5.B and Table 3.5-2A Functional Units 5d and 6c <p>EVALUATOR NOTE: The next step will probably NOT be performed due to 6 hours ^{Six} hours are allowed before the bistables are required to be tripped</p>
	RO	<p><i>I & C to</i></p> <p>DIRECT trip of the following bistables:</p> <ul style="list-style-type: none"> - 1TC-405³-A, "OVER POWER AT TRIP" - 1TC-405³-B, "OVER POWER AT ROD STOP" - 1TC-405³-C, "OVER TEMP AT TRIP" - 1TC-405³-D, "OVER TEMP AT ROD STOP" - 1TC-401³-A, "HI TAVG ALARM" - 1TC-401³-D, "LO TAVG MN STM ISOL" - 1TC-403³-F, "LO TAVG FW ISOL" <p><i>Change in numbers to reflect correct bistables for the failed channel</i></p> <p><i>CVE: I & C will be there in one (1) hour. The I & C Tech is out in Training.</i></p> <p>INITIATE Work Order to repair instrument</p> <p>MAKE necessary log entries</p> <p><i>enhancement</i></p> <p>FOLLOWUP QUESTIONS: EVALUATOR NOTE: After the scenario is complete, a follow up question could be asked as to what instrument failed (i.e. Loop B Tcold failed high, since Loop B Tavg failed high and Loop B AT failed low) the following questions should be asked of the RO and SRO:</p> <ol style="list-style-type: none"> 1) What instrument failed? ANSWER: Loop B Tcold failed high, since Loop B Tavg failed high and Loop B AT failed low. 2) What bistables actually tripped (if any) due to the instrument failure? ANSWER: None

Concur.
 Changes incorporated.
N. Valdez

Op-Test No.: _____ Scenario No.: 3 Event No.: 2Page 3 of _____

Event Description: Pressurizer PORV (CV-31232) leaking (requires isolation)

Time	Position	Applicant's Actions or Behavior
	SRO	<p>EVALUATOR NOTE: The following annunciator ⁵ will alarm when the malfunction is inserted: 47012-0506, "PRZR POWER RELIEF LINE HI TEMP" 47012-0606, "PRZR SAFETY VALVE A OR B HI TEMP"</p> <p>DIRECT or maintain overview of actions for leaking PRZR PORV per ARP 47012-0506, "PRZR POWER RELIEF LINE HI TEMP"</p>
	RO	<p>EVALUATOR NOTE: The operator may isolate Block Valve MV-32195 or MV-32196 FIRST at his discretion to find the leaking PRZR PORV. PRZR PORV CV-31232 is the leaking PORV.</p> <p>PERFORM actions per ARP 47012-0506, "PRZR POWER RELIEF LINE HI TEMP" (ISOLATE PRZR PORVs one at a time with block valves to determine which valve is leaking):</p> <ul style="list-style-type: none"> - CLOSE Block Valve MV-32195 to isolate PORV CV-31231 <ul style="list-style-type: none"> • OBSERVE relief line temperature (NO decrease observed) • RESET acoustic monitor light • OPEN Block Valve MV-32195 - CLOSE Block Valve MV-32196 to isolate PORV CV-31232 <ul style="list-style-type: none"> • OBSERVE relief line temperature (decrease observed) • RESET acoustic monitor light
	SRO	<p>REFER to Tech Spec 3.1.A.2.C (within one hour either restore the PORV to OPERABLE status or close the associated block valve with power maintained to the block valve)</p> <p>DIRECT RO to close ^{or verify closed} PRZR PORV Block Valve MV-32196 to isolate leaking PORV CV-31232 and to maintain power to valve</p>

won't need to perform, since acoustic monitor light won't come on

additional alarm that comes in

should un-isolate 1st valve before going to 2nd valve

Concur.
Changes incorporated.
N. Valdez

Op-Test No.: _____ Scenario No.: 3 Event No.: 3Page 4 of _____Event Description: 12 SG FW Reg Valve controller fails "as is" in AUTO
(will need to control 12 SG level in "MANUAL")

Time	Position	Applicant's Actions or Behavior
		<p>EVALUATOR NOTES: <i>be inserted when power has been reduced to 80% during the load</i></p> <ul style="list-style-type: none"> - This malfunction will NOT be noticed until a power reduction is performed for the next malfunction for 11 Main Feedwater Pump. - The following annunciator will alarm when a high level deviation of 5% occurs in 12 SG during the turbine load decrease performed for the next malfunction: the malfunction 47011-0302, "12 STM GEN LVL DEVIATION" is inserted: <ul style="list-style-type: none"> • 47011-0305, "FW CONTROL FAIL TO MANUAL" <p>DIRECT or maintain overview of actions for 12 SG high level deviation alarm per ARP 47011-0302, "12 STM GEN LVL DEVIATION" 5 "FW CONTROL FAIL TO MANUAL"</p> <p>PERFORM actions for 12 SG high level deviation alarm per ARP 47011-0302, "12 STM GEN LVL DEVIATION" "FW CONTROL FAIL TO MANUAL"</p> <ul style="list-style-type: none"> - PLACE 12 SG FW Reg Valve in "MANUAL" and return level to normal <i>CONTROL</i> <i>within +/- 5%</i>
	BOP	

Change because the alarm "FW CONTROL FAIL TO MANUAL" will occur & 12 SG FW Reg Vlv will go to "MANUAL" upon initiation of malfunction SRO

Concur. Changes incorporated.
N Valdez

Op-Test No.: _____ Scenario No.: 3 Event No.: 4Page 5 of _____

Event Description: High stator temperature on 11 Main Feedwater Pump
(requires turbine load decrease to 330 MWe, since will need to shutdown pump).
11 Main Feedwater Pump trip during load reduction
(will need to rapidly reduce turbine load).

Time	Position	Applicant's Actions or Behavior
	SRO	<p>EVALUATOR NOTE : The following annunciator will alarm when the malfunction is inserted: 47010-0401, "11 FEEDWATER PUMP MOTOR STATOR HI TEMP"</p> <p>DIRECT or maintain overview of actions for high stator temperature alarm per ARP 47010-0401, "11 FEEDWATER PUMP MOTOR STATOR HI TEMP"</p> <p>PERFORM actions for high stator temperature alarm per ARP 47010-0401, "11 FEEDWATER PUMP MOTOR STATOR HI TEMP":</p> <ul style="list-style-type: none"> - VERIFY stator temperature high by observing the redundant stator temperatures - DIRECT local operator to verify motor coolers in operation <u>AND</u> that cool air is being directed on the motor: (Panel 130 located near the 11Main FWP) <ul style="list-style-type: none"> • 11 FW Pump 11A Cooling Fans - Panel 130, Circuit 1 • 11 FW Pump 11B Cooling Fans - Panel 130, Circuit 2 <p>CUES: The local operator reports that: ^{ok, but} The motor coolers are not working and the pump is starting to get hot. It must be something internal to motor. IF crew is hesitant to start reducing power right away, THEN increase stator temperature on ERCS (computer) by 20°C AND insert the following annunciator alarm: - 47010-0401, "11 FEEDWATER PUMP OVERLOAD" (to 140°C)</p> <p>Concur. Charges incorporated (enhancements). <i>N Valdez</i></p>

EVALUATOR
NOTE:

Op-Test No.: _____ Scenario No.: 3 Event No.: 4 Page 6 of _____

Event Description: High stator temperature on 11 Main Feedwater Pump
 (requires turbine load decrease to 330 MWe, since will need to shutdown pump).
 11 Main Feedwater Pump trip during load reduction
 (will need to rapidly reduce turbine load).

Time	Position	Applicant's Actions or Behavior
	SRO	In preparation for stopping the 11 Main FWP, DIRECT power decrease to a turbine load of 330 MWe per 1C1.4 AOP1, "Rapid Load Reduction - Unit 1"
	RO	BORATE the RCS as necessary to maintain control rods above the insertion limit and to control delta I within limits: <ul style="list-style-type: none"> - PLACE the Makeup Mode Selector Switch to "BORATE" - SET YIC-110, "Boric Acid Integrator" to the quantity desired - SET HC-110, "Boric Acid Flow Controller" auto setpoint dial to the flow desired (IF desired, THEN PLACE HC-110 to "MANUAL" and adjust output for the desired flow) - Momentarily PLACE the Boric Acid Makeup switch to "START"
	BOP	REDUCE turbine load in Automatic <u>OR</u> Manual: <ul style="list-style-type: none"> - Automatic: <ul style="list-style-type: none"> • SELECT the desired load rate on the Turbine EHC panel • SET the desired turbine load on the "SETTER" display on the Turbine EHC Panel using the reference control pushbuttons • DEPRESS the turbine control "GO" pushbutton - Manual: <ul style="list-style-type: none"> • DEPRESS the turbine control "TURBINE MANUAL" pushbutton • DEPRESS the "CV ▾" pushbutton until the desired turbine load is reached

Op-Test No.: _____ Scenario No.: 3 Event No.: 4Page 7 of _____

Event Description: High stator temperature on 11 Main Feedwater Pump
(requires turbine load decrease to 330 MWe, since will need to shutdown pump).
11 Main Feedwater Pump trip during load reduction
(will need to rapidly reduce turbine load).

Time	Position	Applicant's Actions or Behavior
		<p>EVALUATOR NOTE: The 11 Main Feedwater Pump trip will be inserted at 70% power during the ramp down. The following annunciator will alarm when the 11 Main Feedwater Pump Trip malfunction is triggered:</p> <ul style="list-style-type: none"> - 47010-0101, "11 FEEDWATER PUMP LOCKED OUT"
	SRO	DIRECT actions to reduce turbine load to less than 330 MWe per ARP 47010-0101, "11 FEEDWATER PUMP LOCKED OUT" and 1C1.4, "Rapid Power Reduction - Unit 1"
	BOP	<p>REDUCE turbine load in Automatic <u>OR</u> Manual to less than 330 MWe:</p> <ul style="list-style-type: none"> - Automatic: <ul style="list-style-type: none"> • SELECT the desired load rate on the Turbine EHC panel • SET the desired turbine load on the "SETTER" display on the Turbine EHC Panel using the reference control pushbuttons • DEPRESS the turbine control "GO" pushbutton - Manual: <ul style="list-style-type: none"> • DEPRESS the turbine control "TURBINE MANUAL" pushbutton • DEPRESS the "CV ▾" pushbutton until the desired turbine load is reached
	BOP	CONTROL 12 SG level with its FW Reg Valve controller in "MANUAL"
	RO	<p>BORATE the RCS as necessary to maintain control rods above the insertion limit and control delta I within limits:</p> <ul style="list-style-type: none"> - PLACE the Makeup Mode Selector Switch to "BORATE" - SET YIC-110, "Boric Acid Integrator" to the quantity desired - SET HC-110, "Boric Acid Flow Controller" auto setpoint dial to the flow desired (<u>IF</u> desired, <u>THEN</u> PLACE HC-110 to "MANUAL" and adjust output for the desired flow) - Momentarily PLACE the Boric Acid Makeup switch to "START"
	SRO	<u>IF</u> the reactor trips, <u>THEN</u> go to 1E-0, "Reactor Trip or Safety Injection"

Concur. Changes
incorporated
(enhancements).
N. Valier

Op-Test No.: _____ Scenario No.: _____ Event No.: 5.6Page 8 of _____

Event Description: (5) Feedwater line break on 11 SG inside containment.
Requires entry into 1E-0 and then 1E-2.
(6) Failure of turbine to AUTO trip on Reactor Trip
(will require MANUAL turbine trip)

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	DIAGNOSE the secondary line break: - Containment pressure increasing - Feedwater flow to 11 SG increasing (IF reactor is NOT already tripped)
	SRO	DIRECT RO to manually trip the reactor (IF reactor is NOT already tripped)
	RO	Manually TRIP the Reactor
	SRO	TRANSITION to 1E-0, "Reactor Trip or Safety Injection"
		<u>1E-0, "Reactor Trip or Safety Injection"</u>
	SRO	DIRECT actions per 1E-0, "Reactor Trip or Safety Injection"
	RO	VERIFY Reactor Trip or Manually Trip the Reactor: - Reactor trip and bypass breakers are open - Neutron flux is decreasing - Rod Position indicators are at ZERO - Rod Bottom lights are LIT
	BOP	VERIFY Turbine Trip (failure of turbine to AUTO trip) - VERIFY both turbine stop valves are closed <u>CRITICAL TASK:</u> Manually trip the turbine before a severe challenge (ORANGE path) develops to the INTEGRITY critical safety function status tree VERIFY Both Safeguards Buses Energized

— Alarm 47011-0301, "11 57M GEN LVL DEVIATION"

additional indication added.

Concur. Change incorporated (enhancement).
M/valor

Op-Test No.: _____ Scenario No.: 3 Event No.: 5,7,8Page 9 of _____

Event Description: (5) Feedwater line break on 11 SG inside containment.
Requires entry into 1E-0 and then 1E-2.

(7) Failure of SI to AUTO actuate (will require MANUAL actuation of SI)

(8) Failure of Containment Isolation to AUTO actuate on SI
(will require MANUAL actuation of Containment Isolation)

Time	Position	Applicant's Actions or Behavior
		<u>1E-0. "Reactor Trip or Safety Injection"</u>
	RO	CHECK if SI is Actuated (failure of SI to AUTO actuate) <u>CRITICAL TASK: Manually actuate Safety Injection</u>
	BOP	<p>VERIFY Safeguards Component Alignment : (failure of Containment Isolation to AUTO actuate on SI) <u>CRITICAL TASK: Manually actuate Containment Isolation</u></p> <p>CHECK IF VERIFY MSIVs are Closed (MSIVs should remain open, since containment pressure is ≈ 17 psig) <i>should be <</i></p> <p>CHECK IF VERIFY Containment Instrument Air Valves are Closed (CV-31740 and CV-31741) (containment pressure is ≈ 17 psig) <i>valves should remain open, since</i></p>
	SRO	ANNOUNCE Reactor Trip and SI
		NOTIFY Station Manager and Site Emergency Coordinator
	BOP	CLOSE CC Supply to SFP Cooling HXs (MV-32115)
	SRO	ENSURE communication with NRC is established within 1 hour
	BOP	OPEN Turbine HP Drains (CS-46392)
		DIRECT Turbine Building Operator to stop the TB roof exhausters and isolate the MSRs per Attachment J
		VERIFY SI Flow
		VERIFY RHR Flow (have NO RHR flow due to high RCS pressure)
		VERIFY > 200 gpm total AFW flow
		VERIFY > 900 psig on AFW Pumps Discharge

add each subject to verify Safeguards Component Alignment

Enhancement

to reflect conditions expected for this scenario

Enhancement

Concur. Changes incorporated
M. Valdez

Op-Test No.: _____ Scenario No.: 3 Event No.: 5Page 10 of _____

Event Description: Feedwater line break on 11 SG inside containment.
Requires entry into 1E-0 and then 1E-2.

Time	Position	Applicant's Actions or Behavior
	BOP	<p><u>1E-0. "Reactor Trip or Safety Injection"</u></p> <p>VERIFY Status of Equipment in Auto Action Guide (Table E0-1)</p> <p>PLACE Steam Dump in "STEAM PRESSURE" Mode</p> <p><u>EVALUATOR NOTE:</u> RCS temperature will be < 547°F and decreasing in the next step</p>
	RO BOP	<p>CHECK RCS temperature is stable at or trending to 547°F:</p> <ul style="list-style-type: none"> - CONTROL AFW flow but NOT < 200 gpm until level restored in the 12 SG - VERIFY SG blowdown valves closed - <u>IF</u> cooldown continues and RCS temperature is < 535°F, <u>THEN</u> close MSIVs (if the MSIVs are NOT closed already) <p>to >50% wide range</p>
	RO	<p>CHECK RCP Cooling:</p> <ul style="list-style-type: none"> - VERIFY CC flow to each RCP > 150 gpm - VERIFY thermal barrier outlet valves open (CV-31245 and CV-31246) - VERIFY seal injection flow to RCPs is normal <p>to reflect that BOP Operator is expected to check these parameters.</p>
	SRO	<p>CHECK PRZR PORVs and Spray Valves:</p> <ul style="list-style-type: none"> - VERIFY PRZR PORVs are closed - VERIFY PRZR Spray Valves are closed <p>CHECK if VERIFY RCPs are NOT Required to be Stopped ^{Should} (RCPs should be kept running)</p> <p>enhancement</p> <p>TRANSITION to 1E-2, "Faulted Steam Generator Isolation"</p> <p>Concur. Changes incorporated. N. Valdez</p>

Op-Test No.: _____ Scenario No.: 3 Event No.: 5Page 11 of _____

Event Description: (5) Feedwater line break on 11 SG inside containment.

(Requires entry into 1E-0 and then 1E-2) *on Activation of Safety Injection*(9) SGTR on 11 SG ~~when SG is fully depressurized~~ *(300 gpm instantaneous)*
(Requires entry into 1E-3 and then 1ECA-3.1)

Time	Position	Applicant's Actions or Behavior
		1E-2. "Faulted Steam Generator Isolation"
	SRO	DIRECT actions per 1E-2, "Faulted Steam Generator Isolation"
	BOP	<p>VERIFY MSIVs and Bypass Valves are Closed</p> <p>CHECK if Either SG Not Faulted:</p> <ul style="list-style-type: none"> VERIFY 12 SG is NOT Faulted IDENTIFY Faulted SG: VERIFY 11 SG is Faulted <p>ISOLATE the Faulted 11 SG:</p> <ul style="list-style-type: none"> ISOLATE Main FW line ISOLATE AFW flow CLOSE steam supply valve from 11 SG to TD AFW Pump VERIFY SG blowdown isolation valves are closed <p>CRITICAL TASK: Isolate the 11 SG before transition out of 1E-2</p> <p>CHECK CST Level > 10,000 gallons</p> <p>CHECK Secondary Radiation:</p> <ul style="list-style-type: none"> INITIATE periodic activity samples of both SGs VERIFY secondary radiation is NOT normal TRANSITION to 1E-3, "Steam Generator Tube Rupture"

- VERIFY 11 SG PORV is closed

add this substep from E-2 procedure

SRO

Enhancements

have SGTR come in earlier to allow identification via Rad Monitors.

Concur. Changes incorporated.
NValer

Op-Test No.: _____ Scenario No.: 3 Event No.: 9 Page 12 of _____

Event Description: SGTR on 11 SG ^{on Activation of Safety Injection (200 gpm instantaneous)} when SG is fully depressurized.
 (Requires entry into 1E-3 and then 1ECA-3.1)

Time	Position	Applicant's Actions or Behavior
		<u>1E-3. "Steam Generator Tube Rupture"</u>
	SRO	DIRECT actions per 1E-3, "Steam Generator Tube Rupture"
	RO	CHECK if ^{should} VERIFY RCPs are NOT Required to Be Stopped (RCPs should be kept running) ← enhancement
	SRO	IDENTIFY that 11 SG is Ruptured
	BOP	ISOLATE Flow from Ruptured 11 SG: - VERIFY 11 SG PORV controller set in Auto at 1050 psig - CHECK 11 SG PORV closed - CLOSE steam supply valve from 11 SG to TD AFW Pump (already closed in E-2) - VERIFY 11 SG blowdown valves closed (already closed in E-2) - CLOSE 11 SG MSIV and bypass valve
	SRO	VERIFY AFW flow to 11 SG Should Remain Isolated (since 11 SG is also faulted)
	RO	CHECK PRZR PORVs and Block Valves: - VERIFY PRZR PORVs are closed - VERIFY at least one PRZR PORV block valve is open
	BOP	VERIFY 11 SG is Faulted and Isolated CONTROL AFW flow to maintain 12 SG Narrow Range Level between 5% and 50% (Wide Range Level between 50% and 59% for Adverse Containment) RESET SI RESET Containment Isolation ESTABLISH Instrument Air to the Containment

Concur. Changes
 incorporated.
 M. Valon

Op-Test No.: _____ Scenario No.: 3 Event No.: 9Page 13 of _____

Event Description: SGTR on 11 SG when SG is fully depressurized.
Requires entry into 1E-3 and then 1ECA-3.1.

Time	Position	Applicant's Actions or Behavior
		1E-3, "Steam Generator Tube Rupture"
	BOP	<p>VERIFY Safeguards Buses are Energized by Offsite Power</p> <p>CHECK if ^{should Be Stopped:} VERIFY RHR Pumps are Required to be Left Running — STOP RHR Pumps</p> <p>VERIFY 11 SG Pressure is < 210 psig</p>
	SRO	<p>TRANSITION to 1ECA-3.1, "SGTR with Loss of Reactor Coolant: Subcooled Recovery"</p>
	SRO	<p>1ECA-3.1, "SGTR with Loss of Reactor Coolant: Subcooled Recovery"</p> <p>DIRECT actions per 1ECA-3.1, "SGTR with Loss of Reactor Coolant: Subcooled Recovery"</p> <p>TERMINATE SCENARIO when transition to 1ECA-3.1 is made.</p>
	BOP	<p>RESET SI (was already reset in 1E-3)</p> <p>RESET Containment Isolation (was already reset in 1E-3)</p> <p>ESTABLISH Instrument Air to Containment (was already established in 1E-3)</p> <p>VERIFY all AC Buses Energized by Offsite Power</p> <p>CHECK if Containment Spray Pumps Should be Stopped: — IF CS Pumps are running AND containment pressure is < 20 psig, THEN: <ul style="list-style-type: none"> • RESET containment spray signal • STOP CS Pumps </p> <p>VERIFY AFW flow to 11 SG Should Remain Isolated (since 11 SG is also faulted)</p> <p>VERIFY RHR Pumps are Required to be Left Running</p>

Terminate scenario earlier since:

- ① Remainder of steps are mostly verifications
- ② No critical steps left.
- ③ Scenario time length is already adequate.

to reflect correct procedure implementation with RCS pressure > RHR pump shut-off head.

Concur. Changes incorporated.
N. Valdez

Op-Test No.: _____ Scenario No.: 3 Event No.: 9Page 14 of _____

Event Description: SGTR on 11 SG when SG is fully depressurized.
Requires entry into 1E-3 and then 1ECA-3.1.

Time	Position	Applicant's Actions or Behavior
		<u>1E-3. "Steam Generator Tube Rupture"</u>
	RO	ESTABLISH Charging Flow: <ul style="list-style-type: none">- ALIGN charging pump suction to the RWST (OPEN MV-32060)- ESTABLISH maximum charging flow
	BOP	VERIFY 11 SG is Faulted and Isolated
		CONTROL AFW flow to maintain 12 SG Narrow Range Level between 5% and 50% (Wide Range Level between 50% and 59% for Adverse Containment)
		INITIATE RCS Cooldown to Cold Shutdown: <ul style="list-style-type: none">- MAINTAIN cooldown rate in RCS cold legs < 100°F/HR- DUMP steam to condenser from the 12 SG
		<u>TERMINATE SCENARIO</u> when RCS cooldown is established
		<i>Delete page. Terminate scenario after transition to 1ECA-3.1 is made.</i>
		<i>Concur. Change incorporated. N. Valdez</i>

SCENARIO #3

Initial Conditions:

Unit 1:

- 100% Power, End of Cycle, Equilibrium Xenon, RS boron = 157 ppm
- Breaker 16-10 (Bus 16/Bus 26 Bustie) is OOS
- Steam Generator tube leakage of 4 GPD in 11 SG

Unit 2:

- 100% power steady state operation

add to reflect
scenario initial
condition

Concur.
Change
incorporated.
M. Valos

Turnover:

- The 11 and 13 Heater Drain Pumps are presently running
- The 13 HD Pump was just started and the 12 HD Pump was shutdown so that preventive maintenance can be performed on the 12 HD Pump

Add another page for NOTES for simulator operator for initial setup for this scenario.

Appendix D

Scenario Outline

Form ES-D-1 (R8, S1)

Facility: Prairie Island

Scenario No.: 4

Op-Test No.: _____

Examiners: _____

Operators: _____

Initial Conditions: Unit 1: 50% power. Middle of Cycle. Equilibrium Xenon.

11 SI Pump is OOS (on hour 16 of a 72 hour clock, expected back in 8 hours).

12 Charging Pump is OOS for overhaul. Breaker 16-10 (Bus 16/Bus 26 Bustle) is OOS.

Steam Generator tube leakage of 4 GPD in 11 SG. ~~delete, doesn't affect scenario~~

Unit 2: 100% power steady state operation

Turnover: Perform power increase on Unit 1 to 100%. Are presently at Step 5.21.E of 1C1.4, "Unit 1 Power Operation" at the step to start the second feedwater pump per 1C28.2, "Unit 1 Feedwater System". Steps 5.5.1 through 5.5.8 of Section 5.5 of 1C28.2 have been completed in preparation for starting the 12 FW Pump. A local operator is available by the 12 FW Pump to perform any required actions during the pump startup.

(Add Mathimation Numbers based on licensee input)

Change to BOL, doesn't affect scenario

entry into rapid load reduction procedure will probably not be necessary.

2 steps for RCS leak 0 to 30 gpm with ramp of 125 sec. 30-150 gpm with ramp of 700 sec

NO

delete event. Event does not affect scenario.

0-6% (TRG 5) 6-30%

Event No.	Malf. No.	Event Type*	Event Description
1		N(BOP)	Start 12 Main Feedwater Pump
2		R(RO)	Reactor power increase
3	RX 213 (TRG 3)	I(BOP)	11 SG pressure channel 1PT-468 failure high (11 SG PORV opens, must manually close PORV)
4	RX 206 (TRG 4)	I(RO)	Pressurizer level channel 1L-428 failure low (letdown isolates, PRZR heaters deenergize, and Charging Pump in "AUTO" increases to maximum speed)
5	RC14 (2 steps)	C(RO)	RCS leak (30 gpm). Requires entry into 1C4 AOP1. 30-150 gpm with ramp of 700 sec
76	RC14 (100%)	M(ALL)	Small break LOCA. (Requires use of E-0, E-1, and ES-1.1)
78	D146924 (TRG 7) D6028 (Time 0)	TC(BOP)	Bus 16 deenergizes due to breaker failure from CT-11 transformer, with a concurrent sequencer failure. Diesel Generator D2 trips during start. (Will need to reenergize Bus 16 from 1RY transformer per 1C20.5 AOP2, since have no (if do not reenergize Bus 16, will need to go to FR C.2 for degraded core cooling due to no high head SI flow, since have no SI Pumps or PD Charging Pumps).
		C(BOP)	11 RHR pump does not AUTO start on SI (will require manual start of pump)

* (N)ormal, (R)eactivity, (I)nsrument, (C)omponent, (M)ajor

6	RP07 (Time 0)	C(RO)	ATWS (reactor trip will work from AMSA C/DSS switch)
---	---------------	-------	--

Add this event. Additional Critical Task for scenario.

Concur. Comments incorporated. M. Baker

Op-Test No.: _____ Scenario No.: 4 Event No.: 1Page 1 of _____

Event Description: Start 12 Main Feedwater Pump

Time	Position	Applicant's Actions or Behavior
	SRO	DIRECT BOP to start the 12 Main Feedwater Pump and maintain overview of plant operations
	BOP	Start the 12 FWP per 1C28.2, Section 5.5, "Starting a Second Feedwater Pump" starting at step 5.5.9:
		<ul style="list-style-type: none"> - PLACE control switch CS-46419 to the "START" position <u>AND</u> HOLD until CV-31875, "12 FWP RECIRC VLV" is FULL OPEN - CLOSE the second FWP warm-up valve F-22-4, "12 FWP PMP WARMUP LINE"
		DIRECT local operator to check the following indications for the 12 FWP:
		<ul style="list-style-type: none"> • VERIFY seal water temperature is increasing to or being maintained at $\approx 150^{\circ}\text{F}$ • OBSERVE no evidence of steaming or external leakage <u>AND</u> OBSERVE seal water leakage is on automatic control (no bypass flow) • VERIFY lube oil pressure > 15 psig • VERIFY the auxiliary lube oil pump stops • THROTTLE the lube oil cooler cooling water outlet valve or outlet bypass valve to control lube oil outlet temperature at $100-125^{\circ}\text{F}$ • VERIFY 12 FWP discharge pressure is ≈ 1200 psig • CHECK vibration on the local Reliance vibration panel for the 12 FWP, step-up gear, and motor (Vibrations should feel steady to the fingertips)
		CUE: The local operator reports that all indications are normal for the 12 FWP

Concur. Comment
incorporated.
n Valor

Op-Test No.: _____ Scenario No.: 4 Event No.: 2Page 2 of _____

Event Description: Reactor power increase

Time	Position	Applicant's Actions or Behavior
	SRO	DIRECT actions per 1C1.4, "Unit 1 Power Operation" and maintain overview of plant operations
	BOP	INCREASE turbine load: <ul style="list-style-type: none">- SELECT the desired load rate on the Turbine EHC panel- SET the desired turbine load on the "SETTER" display on the Turbine EHC Panel using the reference control pushbuttons
	RO	INITIATE an alternate dilution of the RCS per C12.5 as necessary: <ul style="list-style-type: none">- PLACE the Makeup Mode Selector Switch to "ALTERNATE DILUTE"- SET YIC-111, "Reactor Makeup Water Batch Integrator" to the quantity desired- IF desired, THEN CLOSE Boric Acid Blender to VCT Valve CV-31201- Momentarily PLACE the Boric Acid Makeup switch to "START"
	BOP	<u>WHEN</u> Tav _g shows an increase , <u>THEN</u> DEPRESS the turbine control "GO" pushbutton
	RO	MAINTAIN Tav _g within the desired $\pm 1.5^{\circ}\text{F}$ band
	BOP	As power is increased, ADJUST the following as necessary: <ul style="list-style-type: none">- HD Pump speed- SG blowdown

Op-Test No.: _____ Scenario No.: 4 Event No.: 3Page 3 of _____

Event Description: 11 SG pressure channel 1PT-468 failure high
(11 SG PORV opens, must manually close PORV)

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<p>RECOGNIZE the failed transmitter by the following indications:</p> <ul style="list-style-type: none"> - 11 SG pressure channel 1PT-468 failure high - Steam Flow indicator 1FI-464 failure high - 11 SG PORV opens <p>PLACE 11 SG PORV controller in "MANUAL" and CLOSE valve</p>
	SRO	<p>DIRECT actions per 1C51.1, "Instrument Failure Guide" for Turbine 1st stage pressure channel 1PT-485 failure high 11 SG pressure channel 1PT-468</p>
11	BOP SG pressure IPT-468 Channel	<p>PERFORM actions per 1C51.1, "Instrument Failure Guide" for 11 SG pressure channel 1PT-468 failure high: 11 SG pressure channel 1PT-468</p> <ul style="list-style-type: none"> - VERIFY or place 11 SG PORV controller in "MANUAL" and CLOSE valve - VERIFY 11 SG level control operating properly in automatic
	SRO	<p>REFER to the following Tech Spec requirements:</p> <ul style="list-style-type: none"> - TS 3.5.B and Table 3.5-2B Functional Unit 1c
	BOP	<p>EVALUATOR NOTE: The next step will probably NOT be performed due to (6) hours allowed before the bistables are required to be tripped.</p> <p>I&C to DIRECT trip of the following bistables:</p> <ul style="list-style-type: none"> - 1PC-468-A, "LO/LO PRESS SI" - 1PC-468-B, "LO PRESS ALARM" <p>CUE: I&C is available to trip the bistables</p>

Changes to reflect correct instrument failure for this event

change to observe tripping of bistables

Concur.
Changes incorporated.
N. Valdez

Op-Test No.: _____ Scenario No.: 4 Event No.: 3Page 4 of _____

Event Description: 11 SG pressure channel 1PT-468 failure high
(11 SG PORV opens, must manually close PORV)

Time	Position	Applicant's Actions or Behavior
	SRO	<p><u>IF</u> the Thermal Power Monitor is selected to Calorimetric input, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none">- CHECK TPM power unaffected by the steam pressure channel failure- <u>IF</u> affected, <u>THEN</u> CHANGE TPM constant K202 from "0" (Calorimetric input) to "1" (NIS input) per C41.4, "ERCS NSSS Applications Program" <u>AND</u> NOTIFY ERCS computer group <p>INITIATE Work Order to repair instrument</p> <p>MAKE necessary log entries</p>

Op-Test No.: _____ Scenario No.: 4 Event No.: 4Page 5 of _____

Event Description: Pressurizer level channel 1L-428 failure low
(letdown isolates, PRZR heaters deenergize, and Charging Pump in "AUTO" increases to maximum speed)

Time	Position	Applicant's Actions or Behavior
		<p>EVALUATOR NOTE : The following annunciators will alarm when the malfunction is inserted:</p> <ul style="list-style-type: none"> - 47012-0507, "PRZR LVL DEVIATION" - 47012-0607, "PRZR LO-LO LVL HEATERS OFF AND LETDOWN SECURED" - 47015-0203, "CHARGING PUMP IN AUTO HI/LO SPEED"
	SRO/RO	<p>RECOGNIZE the failed transmitter by the following indications:</p> <ul style="list-style-type: none"> - Pressurizer level channel 1L-428 failure low - Letdown isolation / PRZR heater cutoff - Charging Pump in "AUTO" increases to maximum speed
	SRO	<p>DIRECT actions per 1C51.3, "Instrument Failure Guide" for Pressurizer level channel 1L-428 failure low</p>
	RO	<p>PERFORM actions per 1C51.3, "Instrument Failure Guide" for Pressurizer level channel 1L-428 failure low:</p> <ul style="list-style-type: none"> - PLACE charging pump speed control in "MANUAL" <u>AND</u> ADJUST pressurizer level to setpoint - SELECT position "2-1" (WHITE-RED) on the PRZR Level Control Selector Switch - RESTORE pressurizer heaters (must be placed in OFF for about 10 seconds in order for breaker to be closed) - RESTORE letdown per C12.1, "CVCS Letdown, Charging and Seal Water Injection": <ul style="list-style-type: none"> • PLACE 1HC-130, "LTDN TEMP CONT" in "MANUAL" <u>AND</u> OPEN to 50% • PLACE 1HC-135A, "LTDN PRESS CONT" in "MANUAL" <u>AND</u> OPEN to 50% • ESTABLISH charging to Regen HX by adjusting charging line flow valve 1H2-142 and the charging pump speed. • OPEN valve CV-31255, "LETDOWN LINE ISOL" • OPEN letdown orifice isolation valve while adjusting PCV • RETURN pressure and temperature controllers to "AUTO"

Additional valve needs to be opened

Add more detail per steps in procedure C12.1.

Concur.
Changes incorporated.
N. Valos

Enhancements

Op-Test No.: _____ Scenario No.: 4 Event No.: 4Page 6 of _____

Event Description: Pressurizer level channel 1L-428 failure low
 (letdown isolates, PRZR heaters deenergize, and Charging Pump in
 "AUTO" increases to maximum speed)

Time	Position	Applicant's Actions or Behavior
	RO	RESTORE one charging pump speed control to "AUTO" ENSURE pressurizer level recorder NOT selected to Blue channel
	SRO	REFER to the following Tech Spec requirements: - TS 3.5.B and Table 3.5-2A Functional Unit 11
	RO	<p>EVALUATOR NOTE: The next step will probably NOT be performed due to 6 hours allowed before the bistables are required to be tripped.</p> <p>IFC to DIRECT trip of bistable 1LC-428-A, "HI LEVEL TRIP"</p> <p>INITIATE Work Order to repair instrument</p> <p>MAKE necessary log entries</p> <p><u>CUE:</u> IFC will be there in one (1) hour. The I & C Tech is out in Training.</p>

additional
step from
1C51.3

Enhancements

Concur.
Comments incorporated.
M. Valer

Op-Test No.: _____ Scenario No.: 4 Event No.: 5 Page 7 of _____Event Description: RCS leak (30 gpm) ^(2 steps for RCS leak) Requires entry into 1C4 AOP1
0 to 30 gpm with ramp of 120 sec.
30 to 150 gpm with ramp of 300 sec.

Time	Position	Applicant's Actions or Behavior
	RO	<p>DIAGNOSE the RCS leak: ← Annunciator 47022-0108, "HI RADIATION TRAIN B Alarm" PANEL</p> <ul style="list-style-type: none"> - Decreasing pressurizer level - Charging flow increase - Decreasing VCT level - VCT automatic makeup - Annunciator 47012-0507, "PRZR LVL DEVIATION" - Annunciator 47015-0203, "CHARGING PUMP IN AUTO HI/LO SPEED" <p>↑ This was 1st alarm to come in.</p>
	SRO	<p>DIRECT actions per 1C4 AOP1, "Reactor Coolant Leak"</p> <p>IF at any time RCS inventory can NOT be maintained by available charging flow, THEN DIRECT manual trip of the reactor AND go to 1E-0, "Reactor Trip or Safety Injection"</p>
	RO	<p>START additional charging pumps as needed to control pressurizer level</p> <p>IF VCT level can NOT be maintained by the make-up system, THEN align charging pump suction to the RWST</p> <p>Computer Screen ← The computer calculates the leak rate</p> <p>USE Control Board indications to determine approximate leak rate</p> <p>DETERMINE the location of the leak using Figure 1</p> <p>EVALUATOR NOTE:</p> <p>The containment ^{leak} should be identified as the location of the leak based on: being in containment</p> <ul style="list-style-type: none"> - Increasing radiation levels on 1R-11, 12, 2, or 7 - Increasing containment temperature, pressure, humidity - Sump A or C level alarms <p>editorial</p>

Concur.
Changes incorporated.
N. Valer

Op-Test No.: _____ Scenario No.: 4 Event No.: 5 Page 8 of _____Event Description: RCS leak (30 gpm). ^(2 steps for RCS leak) Requires entry into 1E-0 AOP.
 0 to 30 gpm with ramp of 120 sec.
 30 to 150 gpm with ramp of 300 sec.

Time	Position	Applicant's Actions or Behavior
	SRO	<p>COMPLY with Tech Spec 3.1.C.2 which states:</p> <p>"If the total leakage, other than leakage from controlled sources, exceeds 10 gpm, within one hour initiate action to place the unit in HOT SHUTDOWN and be in at least HOT SHUTDOWN within the next 6 hours."</p> <p>EVALUATOR NOTE: At discretion of Chief Examiner, increase size of RCS leak from 30 gpm to 150 gpm with 300 sec. ramp.</p> <p>NOTIFY the General Superintendent of Plant Operations (GSPG) and Resident Inspector of entry into this AOP per SWI 0-28</p>
	SRO	<p>DIRECT actions to reduce turbine load per 1C1.4, "Unit 1 Rapid Power Reduction, Unit 1"</p>
	BOP	<p>REDUCE turbine load in Automatic OR Manual: per 1C1.4, "Unit 1 Power Reduction:</p> <p>Automatic: - IF desired, THEN place rod control in "MANUAL"</p> <p>→ SELECT the desired load rate on the Turbine EHC panel</p> <p>→ SET the desired turbine load on the "SETTER" display on the Turbine EHC Panel using the reference control pushbuttons</p> <p>→ DEPRESS the turbine control "GO" pushbutton</p> <p>Manual:</p> <p>• DEPRESS the turbine control "TURBINE MANUAL" pushbutton</p> <p>• DEPRESS the "CV" pushbutton until the desired turbine load is reached</p>
	RO	<p>INITIATE a negative reactivity addition using control rods OR a boron of the RW per the following:</p> <p>BORATE the RCS as necessary to maintain control rods above the insertion limit and control delta I within limits:</p> <ul style="list-style-type: none"> • PLACE the Makeup Mode Selector Switch to "BORATE" • SET YIC-110, "Boric Acid Integrator" to the quantity desired • SET HC-110, "Boric Acid Flow Controller" auto setpoint dial to the flow desired (IF desired, THEN PLACE HC-110 to "MANUAL" and adjust output for the desired flow) • Momentarily PLACE the Boric Acid Makeup switch to "START" <p>→ WHEN Tave shows a decrease, THEN depress the turbine control "GO" pushbutton.</p>
	SRO	<p>IF the reactor trips, THEN go to 1E-0, "Reactor Trip or Safety Injection"</p> <p>→ Maintain Tave and Tref within 1.5 °F.</p>

delete Entry into Rapid Load Reduction ACP will probably NOT be necessary

Concur.
Changes incorporated.
M. Valdez

Op-Test No.: _____ Scenario No.: 4 Event No.: 6.7 Page 9 of _____
 Event Description: (6) ATWS (reactor trip will work from AMSAC / DCS switch)
Small break LOCA (Requires use of E-0, E-1, and ES-1.1)

Time	Position	Applicant's Actions or Behavior
	RO	DIAGNOSE the small break LOCA: - Decreasing pressurizer level beyond the capability of available charging flow
	SRO	DIRECT RO to manually trip the reactor
	RO	Manually TRIP the Reactor <u>(failure of Reactor to trip from BOTH of the Reactor Trip switches)</u>
	SRO	TRANSITION to 1E-0, "Reactor Trip or Safety Injection"
<p><u>CRITICAL TASK</u>: Manually trip the reactor using the AMSAC DCS Control Switch.</p> <p>add ATWS event for additional CRITICAL TASK</p> <p>Concur. Changes incorporated. N. Valdez</p>		

(500 gpm) on Reactor Trip

Op-Test No.: _____ Scenario No.: 4 Event No.: 7.8 Page 10 of _____

Event Description: (6) Small break LOCA (Requires use of E-0, E-1, and ES-1.1)

(6) Bus 16 deenergizes due to breaker failure from CT-11 transformer, with a concurrent sequencer failure. Diesel Generator D2 trips during start.

Will need to reenergize Bus 16 from 1RY transformer per 1C20.5 AOP2, since have NO
 (if do not reenergize Bus 16, will need to go to FR-0.2 for degraded core cooling due to no
 high head SI flow, since have no SI Pumps or PD Charging Pumps).

(6) 11 RHR pump does not AUTO start on SI (will require manual start of pump)

delete event.
 Does NOT affect
 outcome of
 scenario.

Time	Position	Applicant's Actions or Behavior
		1E-0, "Reactor Trip or Safety Injection"
	SRO	DIRECT actions per 1E-0, "Reactor Trip or Safety Injection"
	RO	VERIFY Reactor Trip: <ul style="list-style-type: none"> - Reactor trip and bypass breakers are open - Neutron flux is decreasing - Rod Position indicators are at ZERO - Rod Bottom lights are LIT
	BOP	VERIFY Turbine Trip: <ul style="list-style-type: none"> - VERIFY both turbine stop valves are closed
		EVALUATOR NOTE: Bus 16 is deenergized due to breaker failure from CT-11 transformer, with a concurrent sequencer failure. Diesel Generator D2 trips during start. VERIFY Both Safeguards Buses Energized: <ul style="list-style-type: none"> - INITIATE action to restore Bus 16 (which is deenergized) per 1C20.5 AOP2, "Reenergizing 4.16 KV Bus 16"
		EVALUATOR NOTE: See Page 18 for actions to reenergize Bus 16 per 1C20.5 AOP2 CRITICAL TASK: Reenergize Bus 16 from 1RY transformer
	RO	CHECK if SI is Actuated: <ul style="list-style-type: none"> - Manually ACTUATE Safety Injection (IF NOT already actuated)
		EVALUATOR NOTE: 11 RHR Pump did NOT auto start
	BOP	VERIFY Safeguards Component Alignment: <ul style="list-style-type: none"> - Manually START 11 RHR Pump CRITICAL TASK: Manually start 11 RHR Pump

delete event
 Does not affect
 outcome of
 scenario.

add substeps for
 checking Safeguards Component Alignment
 enhancement

Concur.
 Changes incorporated.
 N. Valdez

Op-Test No.: _____	Scenario No.: <u>4</u>	Event No.: <u>6⁷</u> (500 gpm) on Reactor Trip	Page <u>11</u> of _____
Event Description: Small break LOCA <u>(Requires use of E-0, E-1, and ES-1.1)</u>			
Time	Position	Applicant's Actions or Behavior	
		1E-0, "Reactor Trip or Safety Injection"	
	BOP	CHECK if <u>(MSIVs should remain open, since</u> VERIFY MSIVs are Closed <u>(containment pressure is > 17 psig)</u> <u>will be <</u> CHECK if VERIFY Containment Instrument Air Valves are Closed (CV-31740 and CV-31741) <u>(valves should remain open, since</u> <u>containment pressure is > 17 psig)</u> <u>will be <</u>	
	SRO	ANNOUNCE Reactor Trip and SI NOTIFY Station Manager and Site Emergency Coordinator	
	BOP	CLOSE CC Supply to SFP Cooling HXs (MV-32115) OPEN Turbine HP Drains (CS-46392)	
	SRO	DIRECT Turbine Building Operator to stop the TB roof exhausters and isolate the MSRs per Attachment J CUE: The TB roof exhausters are stopped and the MSRs are isolated per Attachment J	
	BOP	VERIFY SI Flow <u>(have NO SI flow due to NO SI pumps running)</u> VERIFY RHR Flow <u>(have NO RHR flow due to high RCS pressure)</u> VERIFY > 200 gpm total AFW flow VERIFY > 900 psig on AFW Pumps Discharge VERIFY Status of Equipment in Auto Action Guide (Table E0-1) PLACE Steam Dump in "STEAM PRESSURE" Mode	

Concur.
 Changes incorporated
 (enhancements).
 N. Vala

Op-Test No.: _____ Scenario No.: 4 Event No.: 8⁷ Page 12 of _____Event Description: Small break LOCA ^{(500 gpm) on Reactor Trip} ~~(Requires use of E-0, E-1, and ES-1.1)~~

Time	Position	Applicant's Actions or Behavior
		<u>1E-0, "Reactor Trip or Safety Injection"</u>
	RO	CHECK RCS temperature is stable at or trending to 547°F
	BOP	CHECK RCP Cooling: <ul style="list-style-type: none"> - VERIFY CC flow to each RCP > 150 gpm - VERIFY thermal barrier outlet valves open (CV-31245 and CV-31246) - VERIFY seal injection flow to RCPs is normal
	RO	CHECK PRZR PORVs and Spray Valves: <ul style="list-style-type: none"> - VERIFY PRZR PORVs are closed - VERIFY PRZR Spray Valves are closed
	BOP	VERIFY RCPs are NOT Required to Be Stopped ^{Should} (since have NO SI Pumps running) ^{enhancements} RCPs should be kept running, VERIFY SGs are NOT Faulted VERIFY SG tubes are NOT Ruptured
	SRO	VERIFY RCS is NOT intact: <ul style="list-style-type: none"> - TRANSITION to 1E-1, "Loss of Reactor or Secondary Coolant"

Concur.
Changes incorporated.
N. Valdez

Op-Test No.: _____ Scenario No.: 4 Event No.: 87 Page 13 of _____

Event Description: Small break LOCA. (Requires use of E-0, E-1, and ES-1.1)

(500 gpm) on Reactor Trip

Time	Position	Applicant's Actions or Behavior
		1E-1, "Loss of Reactor or Secondary Coolant" EVALUATOR NOTES: - The crew may enter 1FR-C.2, "Response to Degraded Core Cooling" depending on how long it takes to restore power to Bus 16 per 1C20.5 AOP2 - See Page 20 for actions per 1FR-C.2 <i>delete. Procedure 1FR-C.2 would NOT be entered during this scenario.</i>
	SRO	DIRECT actions per 1E-1, "Loss of Reactor or Secondary Coolant"
	BOP	VERIFY Steam Dump in "STEAM PRESSURE" Mode
	RO	CHECK if RCPs ^{should} are required to be Stopped: - IF an SI Pump is running with flow indicated <u>AND</u> RCS pressure is < 1250 psig (1575 psig for Adverse Containment), <u>THEN</u> STOP both RCPs
	BOP	VERIFY SGs are NOT Faulted CONTROL AFW flow to maintain SG Narrow Range Levels between 5% and 50% (Wide Range Level between 50% and 59% for Adverse Containment)
	SRO	VERIFY Secondary Side Radiation is Normal
	RO	CHECK PRZR PORVs and Block Valves: - VERIFY PRZR PORVs are closed - VERIFY at least one PRZR PORV block valve is open

Concur.
Changes incorporated.
N. Valon

Op-Test No.: _____ Scenario No.: <u>4</u> Event No.: <u>87</u>		Page <u>14</u> of _____
Event Description: Small break LOCA (Requires use of E-0, E-1, and ES-1.1.) (500 gpm) on Reactor Trip		
Time	Position	Applicant's Actions or Behavior
	BOP	<p><u>1E-1, "Loss of Reactor or Secondary Coolant"</u></p> <p>RESET SI</p> <p>RESET Containment Isolation</p> <p>ESTABLISH Instrument Air to the Containment</p> <p><u>EVALUATOR NOTE:</u> <u>IF</u> Bus 16 power is NOT restored, <u>THEN</u> NO Charging Pump will have power. The crew should be attempting to restore offsite power to Bus 16 from 1RY transformer per 1C20.5 AOP2. CHECK power supply to Charging Pumps is energized by offsite power</p>
	RO	<p>- ATTEMPT to restore offsite power to Charging Pumps</p> <p>- <u>WHEN</u> at least one charging pump is running, <u>THEN</u> ESTABLISH charging flow</p> <p>VERIFY SI can NOT be Terminated at this time (since do NOT have RCS subcooling)</p>
	BOP	<p>VERIFY Containment Spray Pumps are Stopped</p> <p><u>EVALUATOR NOTE:</u> <u>Will NOT be able to stop RHR Pumps in the next step until Bus 16 is restored and an SI Pump is running</u> CHECK if RHR Pumps Should Be Stopped:</p> <p>- <u>IF</u> RCS pressure is > 250 psig (550 psig for Adverse Containment) <u>AND</u> RCS pressure is stable or increasing, <u>THEN</u> STOP both RHR pumps</p> <p style="text-align: right;">Concur. Changes incorporated. M. K. L. L.</p>

Op-Test No.: _____ Scenario No.: 4 Event No.: 87 Page 15 of _____Event Description: Small break LOCA ^{(500 gpm) on Reactor Trip} (Requires use of E-0, E-1, and ES-1.1)

Time	Position	Applicant's Actions or Behavior
		<u>1E-1, "Loss of Reactor or Secondary Coolant"</u>
	RO/BOP	CHECK RCS and SG Pressures
	BOP	CHECK if DGs Should Be Stopped
		CHECK if Safeguards Cooling Water Pumps Should Be Stopped
		CHECK if Outside Air Can Be Supplied to Control Room
		VERIFY Containment Dome Recirculation Fans are Running
	SRO	CHECK Auxiliary Building Radiation is Normal
	SRO	DIRECT local operator to align Containment FCU Cooling Water Outlet Radiation Monitors R-16 and R-38:
		- DIRECT local operator to open valves RD-6 and 2RD-4-2
	BOP	CUE: Valves RD-6 and 2RD-4-2 are open
		- VERIFY solenoid isolation valves SV-33384 and SV-33907 are open
	BOP	CHECK if Containment Hydrogen Recombiners Should Be Placed in Service
	SRO	CHECK if RCS Cooldown and Depressurization is Required:
		- TRANSITION to 1ES-1.1, "Post LOCA Cooldown and Depressurization"
		Concur. Changes incorporated. W. Walton

Op-Test No.: _____ Scenario No.: 4 Event No.: 8⁷ Page 16 of _____
 (500 gpm) on Reactor Trip
 Event Description: Small break LOCA (Requires use of E-0, E-1, and ES-1.1)

Time	Position	Applicant's Actions or Behavior
		<u>1ES-1.1, "Post LOCA Cooldown and Depressurization"</u>
	BOP	<p>VERIFY all AC Buses Energized by Offsite Power</p> <p><u>EVALUATOR NOTE:</u> Will NOT be able to stop RHR Pumps in the next step until Bus 16 is restored and an SI Pump is running CHECK if RHR Pumps Should Be Stopped: - IF RCS pressure is > 250 psig (550 psig for Adverse Containment) AND RCS pressure is stable or increasing, <u>THEN STOP</u> both RHR pumps</p>
	RO	<p>CHECK Charging Pump Status:</p> <ul style="list-style-type: none"> - ALIGN charging pump suction to RWST (OPEN MV-32060) - <u>WHEN</u> at least one charging pump is running, <u>THEN ESTABLISH</u> maximum charging flow
	BOP	<p>CHECK Intact SG Levels:</p> <ul style="list-style-type: none"> - CONTROL AFW flow to maintain Narrow Range Level between 5% and 50% (Wide Range between 50% and 59% for Adverse Containment) <p>INITIATE RCS Cooldown to Cold Shutdown:</p> <ul style="list-style-type: none"> - MAINTAIN cooldown rate in RCS cold legs < 100°F/HR - DUMP steam to condenser <p><u>TERMINATE SCENARIO</u> when RCS cooldown is established</p> <p style="text-align: right;">(Concur. Changes incorporated. M. Kalar)</p>

Op-Test No.: _____		Scenario No.: <u>4</u>	Event No.: <u>78</u>	Page <u>17</u> of _____
Event Description: Bus 16 deenergizes due to breaker failure from CT-11 transformer, with a concurrent sequencer failure. Diesel Generator D2 trips during start. Will need to reenergize Bus 16 from 1RY transformer per 1C20.5 AOP2, (if do not reenergize Bus 16, will need to go to FR-C.2 for degraded core cooling due to no high head SI flow, since have no SI Pumps or PD Charging Pumps).				
Time	Position	Applicant's Actions or Behavior		
		<u>Reenergizing Bus 16 from 1RY Transformer per 1C20.5 AOP2</u>		
		CRITICAL TASK: Reenergize Bus 16 from 1RY transformer EVALUATOR NOTE : The following annunciators will alarm when Bus 16 is lost and Diesel Generator D2 fails to start: - 47024-0204, "BUS 16 4.16 KV UNDERVOLTAGE" - 47024-0304, "BUS 16 4.16 KV DEGRADED VOLTAGE" - 47024-0504, "BUS 16 BKR 8 SOURCE FROM BUS CT 11 TRIPPED" - 47024-0804, "D2 EMERGENCY GENERATOR FAILURE TO START" <i>to reflect correct location of annunciator</i>		
	BOP	RECOGNIZE the loss of bus 16, the failure of the Load Sequencer, and the trip of Diesel Generator D2		
	SRO	DIRECT actions to restore Bus 16 per the Alarm Response Procedures and 1C20.5 AOP2, "Reenergizing 4.16KV Bus 16" RECORD Control Room alarms associated with Bus 16 deenergization DIRECT local operator to determine bus protective relay targets and status of bus and breakers CUES: - Local operator reports: • There are NO relay flags present on Bus 16 (except for the UV relays in the sequencer cabinet) • There is NO apparent reason why the CT-11 breaker opened - IF Engineer contacted, THEN recommend reenergizing Bus 16 using 1RY transformer until the cause of the CT-11 breaker malfunction is determined EVALUATOR NOTE: IF the crew decides to try to energize Bus 16 from CT-11, THEN the CT-11 breaker will trip when trying to close in		

since have NO
FR-C.2 would
NOT be
entered
for this
scenario
enhancement

Concur.
Changes incorporated.
M/Alor

Op-Test No.: _____ Scenario No.: 4 Event No.: 18 Page 18 of _____

Event Description: Bus 16 deenergizes due to breaker failure from CT-11 transformer, with a concurrent sequencer failure. Diesel Generator D2 trips during start. ~~Will need to reenergize Bus 16 from 1RY transformer per 1C20.5 AOP2~~ ~~(if do not reenergize Bus 16, will need to go to FR-C.2 for degraded core cooling due to no high head SI flow, since have no SI Pumps or PD Charging Pumps).~~

much have NO

FR-C.2
would NOT
be entered
for this
scenario.

Time	Position	Applicant's Actions or Behavior
		<u>Reenergizing Bus 16 from 1RY Transformer per 1C20.5 ACP 2</u>
	SRO	DETERMINE that CT-11 feeder breaker to Bus 16 opened
	BOP	PLACE Bus 16 Voltage Restoration Switch in "MANUAL"
		PLACE the three(3) Bus 16 feeder breaker closure selector switches in "MANUAL"
		PLACE Bus 16 loads in "PULLOUT"
		PLACE Bus 16 Synchroscope Selector Switch to "1RY"
		CLOSE Breaker 16-2 (Bus 16 Source from 1RY Transformer) to reenergize Bus 16
		VERIFY Bus 16 between 4000-4400 volts
		PLACE Bus 16 Synchroscope Selector Switch to "OFF"
		RESTORE power to 480V Buses 121 and 122:
		- VERIFY Breakers 121A and 122A are open
		- VERIFY Breakers 121M and 122M are closed
		- CLOSE Breaker 16-4 (Bus 16 feed to 121M Transformer) to reenergize Bus 121
		- CLOSE Breaker 16-11 (Bus 16 feed to 122M Transformer) to reenergize Bus 122
		RESTORE Bus 16 loads:
		- START 12 SI Pump
		CRITICAL TASK: START 12 SI Pump

Enhancement

Concur.
Changes incorporated.
N. Valdez

delete page.
1FR-C.2 would NOT be entered during scenario.
Concur. Comment incorporated M. Valer

Op-Test No.: _____ Scenario No.: 4 Event No.: 7 Page 19 of _____

Event Description: Bus 16 deenergizes due to breaker failure from CT-11 transformer, with a concurrent sequencer failure. Diesel Generator D2 trips during start. Will need to reenergize Bus 16 from 1RY transformer per 1C20.5 AOP2 (if do not reenergize Bus 16, will need to go to FR-C.2 for degraded core cooling due to no high head SI flow, since have no SI Pumps or PD Charging Pumps).

Time	Position	Applicant's Actions or Behavior
		EVALUATOR NOTE: The crew may enter 1FR-C.2, "Response to Degraded Core Cooling" depending on how long it takes to restore power to Bus 16 per 1C20.5 AOP2. <u>1FR-C.2, "Response to Degraded Core Cooling"</u> SRO DIRECT actions per 1FR-C.2, "Response to Degraded Core Cooling" BOP VERIFY Proper SI Valve Emergency Alignment VERIFY SI Flow RO CHECK RCS Vent Paths: - VERIFY PRZR PORVs are closed - VERIFY at least one PRZR PORV Block Valve is open - VERIFY Reactor Head Vent Valves are closed CHECK RCP Status: - VERIFY at least one RCP is running CHECK RVLIS Dynamic Head Indication: - IF < 62% and decreasing (for 2 RCPs running), <u>THEN REDUCE</u> to one RCP running BOP VERIFY SI Accumulator Isolation Valves are open CHECK Intact SG Levels: - CONTROL AFW flow to maintain Narrow Range Level between 5% and 50% (Wide Range between 50% and 59% for Adverse Containment)

Delete page 1FR-C.2 would NOT be entered during scenarios.

Concur. Comment incorporated. M. Valdez

Op-Test No.: _____ Scenario No.: 4 Event No.: 7 Page 20 of _____

Event Description: Bus 16 deenergizes due to breaker failure from CT-11 transformer, with a concurrent sequencer failure. Diesel Generator D2 trips during start. Will need to reenergize Bus 16 from 1RY transformer per 1C20.5 AOP2 (if do not reenergize Bus 16, will need to go to FR-C.2 for degraded core cooling due to no high head SI flow, since have no SI Pumps or PD Charging Pumps).

Time	Position	Applicant's Actions or Behavior
		<u>1FR-C.2, "Response to Degraded Core Cooling"</u>
	BOP	DEPRESSURIZE SGs To 200 psig: - MAINTAIN cooldown rate in RCS cold legs < 100°F/HR - DUMP steam using SG PORVs
		CHECK RHR Pumps are Running
	SRO	<u>IF</u> either RCS hot leg temperature is < 390°F, <u>THEN</u> perform the following:
	BOP	• DIRECT local operator to unlock and energize the accumulator isolation valve breakers
	BOP	• RESET SI (was already reset in E-1)
	BOP	• CLOSE accumulator isolation valves (MV-32071 and MV-32072)
	RO	• STOP running RCP
	BOP	DEPRESSURIZE SGs To Atmospheric Pressure: - MAINTAIN cooldown rate in RCS cold legs < 100°F/HR - DUMP steam using SG PORVs
		VERIFY SI Flow
	SRO	<u>WHEN</u> SI flow is verified, <u>THEN</u> ISOLATE SI Accumulators: (<u>IF NOT</u> done in previous step)
	BOP	- DIRECT local operator to unlock and energize the accumulator isolation valve breakers
	BOP	- RESET SI (was already reset in E-1)
	BOP	- CLOSE accumulator isolation valves (MV-32071 and MV-32072)
	RO	STOP running RCP

Op-Test No.: _____ Scenario No.: 4 Event No.: 7Page 21 of _____

Event Description: Bus 16 deenergizes due to breaker failure from CT-11 transformer, with a concurrent sequencer failure. Diesel Generator D2 trips during start. Will need to reenergize Bus 16 from 1RY transformer per 1C20.5 AOP2 (if do not reenergize Bus 16, will need to go to FR-C.2 for degraded core cooling due to no high head SI flow, since have no SI Pumps or PD Charging Pumps).

Time	Position	Applicant's Actions or Behavior
		<u>1FR-C.2, "Response to Degraded Core Cooling"</u>
	RO	CHECK Core Cooling: <ul style="list-style-type: none">- CHECK RVLIS full range > 63%- CHECK either RCS hot leg temperature < 350°F
	SRO	TRANSITION to 1E-1, "Loss of Reactor or Secondary Coolant"

*Delete page.
1FR-C.2 would NOT be entered
during scenario.*

*Concer.
Comment incorporated.
N. Valdez*

SCENARIO #4

Initial Conditions:

Unit 1:

- 50% power, ^{Beginning} ~~Middle~~ of Cycle, Equilibrium Xenon
- 11 SI Pump is OOS (on hour 16 of a 72 hour clock, expected back in 8 hours)
- 12 Charging Pump is OOS for overhaul
- Breaker 16-10 (Bus 16/Bus 26 Bustie) is OOS
- ~~Steam Generator tube leakage of 4 GPD in 11 SG~~

change to BCL, doesn't affect scenario

delete, doesn't affect scenario

Unit 2:

- 100% power steady state operation

Turnover:

- Perform power increase on Unit 1 to 100%
- Are presently at Step 5.21.E of 1C1.4, "Unit 1 Power Operation" at the step to start the second feedwater pump per 1C28.2, "Unit 1 Feedwater System"
- Steps 5.5.1 through 5.5.8 of Section 5.5 of 1C28.2 have been completed in preparation for starting the 12 FW Pump
- A local operator is available by the 12 FW Pump to perform any required actions during the pump startup

Concur.
Changes incorporated
NValer